40873

The Builder

AN

✣ ILLUSTRATED ✣ WEEKLY ✣ MAGAZINE ✣

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR, SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word TO BUILD is the Anglo-Saxon Bylðan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"Always be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE.

59

VOLUME LIX.—JULY TO DECEMBER, 1890.

OFFICE: No. 46, CATHERINE STREET, COVENT GARDEN, LONDON, W.C.

Printed by
The Hansard Publishing Union, Lim.,
Great Queen St., London, W.C.

[Vol. LIX., No. 2474.—Saturday, July 5, 1890.

The Builder

ILLUSTRATIONS.

Pavilion of Catherine de Medicis, Château de Blois.—Drawn by Mr. Herbert Railton ..... *Double-Page Photo-Litho.*
Sheffield Municipal Buildings: Final Competition.—Design (with two Plans) Submitted by Mr. H. T. Hare ..... *Double-Page Photo-Litho.*
Equestrian Statue of Velasquez.—M. Frémiet, Sculptor ..... *Double-Page Ink-Photo.*
Proposed "Eiffel Tower" for London: First Premiated Design.—Messrs. Stewart, Maclaren, & Dunn, Architects ..... *Double-Page Ink-Photo.*
Victoria Hotel, Milford-on-Sea, Hants.—Mr. W. C. Evans, Architect ..... *Double-Page Photo-Litho.*

Blocks in Text.

The Old Church House, Chelsea ..... *Page* 8
Fawcett's Fireproof Floor, with Provision for Ventilation, &c., as used at the Children's Hospital, Great Ormond-street 9
Hot-Water Supply: Diagrams Illustrating paper in "The Student's Column" 15

CONTENTS.

Earthwork Slips and Subsidences upon Public Works 1
Sub-Contracting in the Building Trade. By E. C. Robins, F.S.A. 3
Submerged Buoyant Bridges 3
Notes 4
Letter from Paris 6
The Montpellier Baths Competition, Harrogate 7
A Smoke Annihilator 7
The Old Church-House, Chelsea 8
The Association of Municipal Sanitary Engineers and Surveyors: Meeting at Liverpool 8
Floor-Section at Children's Hospital, Great Ormond-street 9
The Pavilion of Catherine de Medicis, Blois 9
The Sheffield Municipal Buildings Design 9
Sculpture: "Velasquez" 9
The Proposed "Eiffel Tower" for London 9
The Victoria Hotel, Milford-on-Sea, Hants 12
The London County Council 12
Archæological Societies 13
Books: Planat's "Encyclopédie de l'Architecture et de la Construction" (Dujardin, Paris); Acworth's "Railways of Scotland" (Murray); "Practical Perspective" (Ferguson); Knight's "New Perspective Guide" (Simpkin, Marshall) 13
Correspondence: The Architectural Association—Public Surveyorships—Wooden Water-pipes 14
The Student's Column: Hot Water Supply for Baths, Lavatories, and other Domestic and General Purposes.—I. 15
Surveyorships 15
Obituary 15
General Building News 16
Sanitary and Engineering News 16
Stained Glass and Decoration 16
Foreign and Colonial 16
Miscellaneous 17
Legal 17
Meetings 18
Recent Patents 18
Some Recent Sales of Property 18
Prices Current of Materials 18
Tenders 19

*Earthwork Slips and Subsidences upon Public Works.**

IT is not very long since the students in engineering at King's College, on perusing their examination paper, found the following question amongst the ten which they had to answer in three hours:—"Illustrate by sketches how to prevent slips in railway cuttings, and how to provide for the drainage of the line."

A considerable part of the 225 pages which Mr. Newman has devoted to the subject named at the head of this article is expended on solving the question put by the examiner to the students, and if either the examiner on the one hand, or the students on the other, were fully aware of the extent and variety of the preventive measures which have to be considered and brought under review in dealing with slips in cuttings and the drainage of a line of railway, the hairs of both parties might well have been expected to slightly rise; for it is manifest,—or, at all events, it is manifested by Mr. Newman,—that long before the close of the three hours, it would have become apparent to them that full credits to such a question were wholly unattainable.

But even Mr. Newman does not attempt to solve this question by illustrative sketches, nor do we very clearly see how, unless a special case is stated, *preventive* measures are to be so illustrated, whatever might be the case with remedial measures.

We are not, however, concerned now with the examinations at King's College, but with Mr. Newman's book on slips in earthworks, and we gladly welcome it as an important contribution to a right comprehension of such matters. There are few things more annoying or more calculated to vex the soul of an engineer, whether he be engaged on railway, water, dock, or other works, than the failures which, with all his care, and often with a most extensive stock of experience and good reputation, will sometimes happen to the works he has executed, or is in the course of executing; but there is much in this book which will at all events guide the mind of the student to the points, and there are many of them, which have to be weighed by designers of engineering works, and which, if attended to, and fixed on the memory, will certainly guard them against probable if not against possible slips in earthworks.

It is very easy to blame the engineer when such things happen, and when anything with which he is connected goes wrong.

A case which is referred to by the author is here given, and, though it seems almost too good to be true, is one which we presume is actually a fact, for it appears between inverted commas as a quotation from a report. It is from the report of a local committee, formed to declare the best means of preventing floods in a district. After deep consideration they reported as follows:—

> "That the committee were of opinion the floods would be permanently removed provided the engineer diverts all rivers, streams, watercourses, and ditches to the next valley, and closes the upstream hole in the hill, and causes the water to be discharged into the next valley, or elsewhere, and reduces the rainfall within the limits required by the inhabitants of the district."

It has been surmised that the operations of the Arab and the sword have had a certain effect in reducing the rainfall in some portions of the globe, by reason of the neglect and decrease of vegetation under certain conditions, but it is hard for the engineer to be bracketed with the Arab, and to be called on to interfere with that which is usually considered to be a providential arrangement. Doubtless he could have stopped the "upstream hole in the hill," and caused the water to be discharged into the next valley *or elsewhere*, and, if necessary, have removed mountains, but the local committee would probably have looked somewhat aghast when the estimates were laid before them.

The points which Mr. Newman more particularly insists on (and so frequently refers to in the course of the work under review, that unless we were assured that this repetition must be for the express object of hammering them into the mind, we should feel inclined to say that it was unnecessary), are, firstly, that water is the cause of nearly all the slips, and, secondly, that the properties belonging respectively to the various kinds of rocks and soils should be fully considered. He enters very minutely, not to say microscopically, into this analysis of soils, taking consecutively the chalks, marls, clays, gravels, and sands, &c.; explains the proportions of water which each kind is capable of absorbing, their relative weights when in a wet or in a dry state, their natural angles of repose when kept dry and when saturated, the frictional powers possessed by the particles of which each kind of soil is composed for resisting its tendency to slip, and so on. There is much to read, and read carefully, on all these points, as well as on the contraction of ground under pressure (such as that of an embankment) when well drained. The author prominently exhibits the bump of caution when he says that it is impossible (and the use of such a word is generally objectionable) "to determine any rules even for a particular soil." Still, we may expect to receive evidence of their general behaviour under the different conditions to which they are ex-

* "Earthworks," &c. By John Newman. London: E. & F. N. Spon. 1890.

posed by such causes as those of the atmosphere combined with the hand of man, and it has become a habit with us to say, "*as a rule*, such and such a thing happens"; and as the author gives lists of the slopes which have "as a rule" been found most appropriate and safest for various soils under various conditions, and gives detailed accounts of a good many effects which are found generally to occur in practice from ascertained causes, it is rather superfluous to say that it is "impossible to determine rules." What is the use of a book of this kind if it is not to furnish us with rules for our guidance, to save our time, and to tell us something of which we were previously ignorant? It is not improbable that many engineers who have been much engaged in field practice have met, at some time or other in the course of their work, with most of the peculiarities mentioned by the author in the behaviour of earth, and have had to exercise what is called their "common sense." It is, perhaps, a proper pride which leads so many of us to treat with indignation the suggestion that we are not highly endowed with that merit (or virtue), but even to those who do possess it, the rapidity with which a right conclusion may arrive to that commonly sensible mind must vary with individuals, and one object in a book of this kind must be to save the time of the more slowly-revolving brains of those who are frequently called "practical" men by supplying them with the boiled-down experiences of others in the shape of rules.

There may be other causes than those mentioned by the author which conduce to slips and subsidences in cuttings, but he presents us with thirty-one heads of the chief causes, the first ten of which he classes as natural, and the remainder as artificial. Similarly, he gives us thirty-eight separate heads of the chief causes of slips and subsidences in embankments, of which seven are classed as natural. The definition of natural is intended to apply to those which are "beyond the power of man to entirely prevent," and that of artificial to those which are "in some degree to be prevented, unless obviously the result of the unavoidable exigencies of construction." We have no desire to be considered hypercritical, but we must bear in mind that the avoidable exigencies of construction are those which can be anticipated by a combination of various qualities, such as knowledge, care, and the aforesaid common sense; and when slips occur in consequence of an insufficiency of those qualities on the part of engineers or others, then such slips and subsidences can scarcely be termed unavoidable. It is with the help of such a book as this that the number of cases ought to be greatly increased in which slips can be avoided by exigencies being anticipated.

10. There is considerable identity in the causes of slips in cuttings and embankments respectively, such as the action of rain, snow, and frost on the several parts of a slope, and more especially on the toes and feet of slopes, the insufficiency or neglect of suitable drainage of the ground immediately at the back of the faces, and of the ground adjacent to slopes, honeycombing by rodents, vibration, excess of slopes, &c. With respect to cuttings, he assigns more particularly (in addition to the above named) the removal of support against the action of sliding (especially on "side-long" ground); the blasting of laminated rock dipping at a considerable angle towards a cutting in the side of a hill; the neglect to fill up, or otherwise remedy, cracks or fissures in the slopes; and, with respect to embankments, unequal loading, want of adhesion between the surface of the ground upon which an embankment is tipped and the deposited material; tipping the central part first, and completing the width and slope by side deposition after some time has elapsed; the backing up of water behind a retaining wall, or the failure to provide for its removal from the bottoms of benches, &c.

He then presents us with sixteen maxims, to be observed, where practicable, in the consideration of the location of earthworks (hints as to what should be avoided, which are of considerable value); but unfortunately other considerations almost invariably outweigh these points except in a minor degree, though the capital cost of a work and the cost of its maintenance may both be very sensibly reduced by attention to all the points alluded to by the author.

Referring to tunnelling in clay, the author reminds us of "the enormous force clay possesses upon swelling, and its contraction upon drying," causing them to be risky undertakings, and that especial care should be taken to allow for this "by reducing the uncovered lengths to the least dimensions, having dry, yet hard and compressible filling between the arch and the walls and the clay, using material with great compressive strength for the lining, leaving plenty of weeper-holes, and draining away all water as it exudes." Suggestions which, of course, sound commonplace to a practised engineer, but are useful to the student.

In the chapter on the treatment of slipped earth he gives, as aids to memory, the following four questions, which have to be determined when a slip has occurred:—

1. Should the whole or part of the earth that has slipped be removed?
2. How are the voids to be filled that have been caused by the slips?
3. Can the disturbed material be again used?
4. What protective measures should be adopted?

We should be disposed to suggest an addition to such questions, as follows:—

What time is available for the execution of this work?

We do not quite follow the author in his suggestion (p. 75) that it "may be advisable to allow the overflow waters of a river, when the extreme flood level is known, to gently pass over a line of railway, it being kept at such a level as not to impede free working, and to ensure that any back water is not prevented from escaping." Nor can we agree with the conclusion at which he arrives if this be not allowed.

The advice given in the chapter on Methods of Draining is sound and good, though it seems scarcely necessary to bring so repeatedly before the reader, both here and elsewhere, the fact that water percolates with facility though sand, and does not do so through clay.

Speaking of culverts, the author says:—

"In some countries having a severe climate, or in high mountainous districts where the soil is rock, and a heavy discharge of flood-water occurs, instead of placing a culvert and gathering the waters at or about the level of the toe of an embankment, in deep hillsides or ravines an unlined tunnel is made under the embankment in the rock, thus avoiding a masonry or brickwork structure, which could only be set in the summer months, and preventing the waters touching the seat of an embankment and promoting a slip."

We do not know of any such cases, and we should take the strongest objection to such an arrangement. If the time of year was unsuitable for making a masonry culvert, it would be equally unsuitable for making a tunnel; the tunnel would have to be a much greater length than the culvert, it would be a great deal more expensive, more easily blocked by rocks and trees, and, if blocked, place the embankment in a position of great risk. A half-sunk culvert, with a basin on the upper side, would, in such a case, be distinctly preferable. It is an entirely different case to that of a discharge-outlet from a reservoir.

In the chapter on the safe maximum load upon different earths and on normal pressures, we find some useful tables of an accuracy generally sufficient, but the author is wisely careful in enumerating half a dozen or more saving clauses which affect the figures given in those tables, the most important of which is perhaps the "comparative dry or wet state of the earth." But he generalises in a manner which is very common and very misleading in his table on the weights of substances, by giving fixed weights to certain classes of rocks and soils, such as granite 2·10 tons to the cubic yard, whilst, as a matter of fact, some granites are at least 12 per cent. heavier than others. He is also not sufficiently accurate in giving sandstone from 1·70 to 1·95 tons to the yard, the actual range giving a difference of about 70 per cent. between one kind and another. There are also useful tables of reference of the general range of slopes in many kinds of soil, and of the co-efficients of friction, and the author shows with sufficient clearness the inexpediency of cutting diagonal or transverse trenches in the surface of the slope, as tending to disturb and destroy the continuity of supports of the surface, and do more harm than good if by any means such trenches got choked.

We are glad to see that the author enters at some length into the subject of the due provision of drainage at the backs of retaining walls, a matter so often neglected or overlooked, and carries this subject to a far larger one, the causes which tend to disturb the repose of dock walls. His remarks on these matters are well worthy of consideration, and are thoroughly practical, and the items which have to be taken into account in the necessary statical calculations very well introduced. We were not, however, aware, nor are we prepared to allow the accuracy of his statement, that "there are few extensive docks that have been constructed in any but the firmest earth that have been free from such a mishap," *i.e.*, "masses of the wall sliding forward from want of sufficient depth of foundation or hold on the ground." The construction of walls for wet docks which will stand all right when once the water has been let in is comparatively a simple matter, but the difficulties lie and the failures have occurred before that all-important time has arrived; and unless it is recognised that as dock walls are raised, so should advantage be taken of the thrust of water against them, and of the weight of water over that portion of the bottom of the dock which lies immediately in front of the bottom of the wall, it is not improbable that failures will continue to occur, failures whose importance in cost is in no way measured by the actual cost of the work of repair.

A little hint is given by the author which is very useful to bear in mind, though sometimes from motives of so-called economy disregarded, it is that "anything tending to make a wall of varying strength, unless exceptionally required, should be avoided: such as the junction of lime concrete with Portland cement concrete, or the employment of the hardest and strongest bricks or stones and their connection by means of a weak mortar."

In the chapter on the "Foundations of a Tidal Embankment," the author introduces us to a few calculations (pages 182 to 186); but it is unfortunate that he should in several cases have miscomputed the volumes of some of the masses of embankment, as these form the bases of the calculations, and the results arrived at are, consequently, in one case, at least, entirely erroneous. As no diagrams are given, to which the reader can refer, it is still more puzzling to follow him in these calculations; but the error is sufficiently apparent,—one, perhaps, that a schoolboy might make, but which ordinary care should have prevented from being committed in a work of this nature,—viz., that the area of a right-angled triangle is not the sum, but half the sum of the perpendicular and the base.

In conclusion, we may say that there is plenty of good, useful information to be obtained from this work, which touches a subject possessing an exceedingly scanty vocabulary; but it is a work not without blemish; the style is tedious, and the language often involved; commas and semicolons are frequently stuck in wrong places, necessitating a reperusal of a paragraph, and consequent waste of time before the sense of a sentence can be detected. If the work reaches a second edition, these defects may perhaps be rectified, but even with those defects, it is a book containing an immense deal of matter, which must be swallowed sooner or later by every one who desires to be a good engineer, not excluding the students of King's College.

SUBCONTRACTING IN THE BUILDING TRADE.

BY EDWD. C. ROBINS, F.S.A.

ABSENCE from town prevented my taking part in the discussion of this subject which took place at the Council of the Institute on the 23rd ult., but its importance cannot be exaggerated, and it is to be hoped that the relations between the architect, the contractor, and his subordinates will receive that careful consideration which the President promised.

The root of all the evils complained of is the spirit of unrighteous competition with which this age is cursed. The unprincipled mass of the general public cares nothing about consequences to others,—it is only concerned about itself; the convenience and profit of competitive exactions is too great to be sacrificed for such commonplace things as principle and justice.

The virtuous public argues in this manner: "Charity begins at home. I want a building to suit my needs at the least possible cost; therefore, since it would cost money to go straight to an architect for a design, I will advertise for one that will not only cost me nothing, but will set twenty architects to struggle which can outbid the other in anticipating my wishes. Having got twenty designs to select from, I shall make it a condition that my acceptance of one of them shall be dependent on its being built for a sum not exceeding ten per cent. of the architect's estimate, by which means I shall utilise his wits in my interest to the uttermost.

"I shall next get up a competition between the builders by inviting some dozen to give me tenders for the execution of the work. I will then accept the lowest estimate and rely upon my architect to get the best material and workmanship out of the contractor he possibly can, who shall be bound to carry out the works to his satisfaction within the stipulated time, under heavy penalties. It matters little to me who does the work, so that I have a resposible man as contractor, who, if he loses over my contract, may repay himself out of another where the competition has been less keen,—while my architect, for his own credit's sake, will see me safely through, 'doing it all in a legal way.' Public opinion is not sufficiently enlightened to question my action or my motives; moreover, is it not the common custom, and therefore not to be considered reprehensible in any way?"

Under such circumstances, is it any wonder that builders sublet to secure themselves from loss? The system is one of diamond cut diamond from beginning to end. How is the selfish public to be taught better, where every encouragement is given it to do worse, and not only commit the transgression, but to shut its eyes to the almost inevitable consequences?

As an editor, you say "that we live in an age where there is no time to consider this, and everyone must go the pace or drop out," but you "would welcome an effort to stem the torrent."

That effort has been made at the School Board and at the County Council, and as a consequence underselling builders are not to be invited to tender. General public competition is to be tabooed, and only selected men are to be suffered to compete. This is a step in advance and the very least that should be done. A fair price for good work is desired to be given, as the cheapest in the end, and subletting may fairly be expected to cease among batches of builders who compete with one another on the previous and precise understanding that sweating prices are to be disallowed.

But why must we continue to insist on the one man system? The masterpieces of the middle ages were not so raised. The "Prentice Pillar" of Rosslyn Chapel was not the work of a chance journeyman of a great contractor.

Mr. Macvicar Anderson, like many more of us, finds it needful to make special terms with specialists for special work required to be specially well done, and such estimates may be included in the general contractor's lump-sum contract when that is a necessity, but it is better that he should be separately contracted with and his credit for his portion of the work equally shared with his colleagues.

Mr. Aitchison thinks it would give more trouble to the architect. I doubt it. The trouble is how to get good work done at all when there is no personal interest in doing it, except as a means of livelihood; whereas, were there to be masters in each trade, and were these masters to be separately responsible, there would then be some one to look to, whose pride in his craft and knowledge of all its details would enable him to rear apprentices and bring his own skilled workman to bear upon his portion of the work to be done.

There might still be one to provide scaffolds and service of all trades and things of common usure.

The "universal provider" system now in vogue is destructive of all personal relations between the employer and the employed. A huge company possessed of neither body nor soul, a sort of calculating machine or financial centre, is substituted for the honourable master-craftsman and his army of respectful disciples.

The spirit of the age is in favour of co-operative concentrativeness, and to such an extent is this carried, that soon no private business will be found competent to compete with the capitalist whose capital is concentrated in the hands of a few, for the so-called benefit of the many, but really for their own aggrandisement. Looming in the distant future is the great confederacy, the monster monopoly of a ring of universal providers and mighty companies; and the extinction of all individuality and independent worth and enterprise, unless cut short by the realisation of Mr. Bellamy's State organisation, foreshadowed in "Looking Backward."

We may, however, as has been shown, do something to avert these evils, if only we can recognise them as evils and work against them. We may help to raise the tone and character of Trade Unions and give the sympathy of the profession with the leaders of the movement, and help to make public opinion fairer, so that good, capable workmen may be delivered from the oppression of the incompetent, and not bound to work down to the level of their fellows' incapacity, and be content with the same terms and pay.

Some mode of improving the condition of the deserving should be developed,—by rewarding the already competent by a system of remuneration in which merit shall meet its due reward in corresponding emolument. These are the men to whom "profit sharing" would not be demoralising, but an encouragement in well doing. We cannot suppose that the great contractor is alone disinterested and honest enough to give the best materials and workmanship; his best men will be ready to follow his lead, and to maintain the reputation of the firm which is their commonwealth, if mutual confidence is established and maintained.

E. C. R.

SUBMERGED BUOYANT BRIDGES.

THROUGH railway communication between all the largest European towns at the present day is only prevented by the great expenditure entailed in bridging over, or tunnelling under, the many large rivers and channels which now interrupt through traffic, and, although in some cases objections might arise from military considerations, yet it is nearly always financial, and not engineering or military, difficulties that have to be surmounted.

The easiest method of overcoming this interruption to through traffic is generally by means of a bridge, for so great is the progress made during recent years in the science of bridge building, owing chiefly to the introduction of mild steel, that in nearly all cases this method is to be preferred.

When, however, the river or channel to be crossed is so deep as to render the formation of piers a very difficult operation, or the shipping interests demand great headroom and very large spans to be allowed, a tunnel may be more suitable, although the experience gained by most sub-aqueous tunnels teaches the engineer, if possible, to avoid them.

During the last few years several schemes have been proposed as substitutes for the ordinary bridge and tunnel referred to, the chief advantages of which are stated to be, firstly, that they do not, like ordinary bridges, interfere with the navigation of the channel crossed, and secondly, their construction is much more simple than a tunnel, and consequently more economical.

Such schemes as these are generally described as "Submerged buoyant bridges," and consist of a water-tight tubular structure through which the roadway is made. Such tubes would be submerged at any convenient depth, and, having considerable buoyancy, it would be necessary to hold them in position, both vertically and horizontally, by ties and anchors.

Mr. James Maxton, M.I.N.A., in an essay originally read as a paper at the Belfast Natural History and Philosophical Society last April, proposes such a scheme for a bridge between Ireland and Scotland, to be placed between Donaghadee and Portpatrick, a distance of nineteen nautical miles. The maximum depth of water along this route is about 900 ft.

Mr. Maxton, in his paper, does not enter into any great detail of his scheme, the description being intentionally more or less popular, so that it is not possible to criticise his methods of overcoming the difficulties that would arise should such a scheme ever be seriously entertained, but it is our opinion there is no possibility of a work of this nature ever being carried out.

A structure depending on anchorages, which in the majority of cases could never be inspected even when first laid down, is not likely to obtain the confidence of the public, if even responsible contractors could be found who would be willing to undertake its construction in such an exposed position for any sum within measurable distance of Mr. Maxton's estimate of 5¼ millions sterling.

It is curious that Mr. Maxton, in working out his scheme for connecting the railways of Ireland and Scotland, has, without knowing it, suggested a structure almost identical with that proposed by Sir E. J. Reed, who in 1886 patented "a system of connecting railways which are separated by rivers or other waters." Near the end of his paper, Mr. Maxton suggests that "in those cases where the conditions are favourable, the tubes forming the bridge could rest on submerged piers, thereby dispensing with anchors and cables, the buoyancy being resisted by any suitable means, such as filling in the space between the shells of the tubes with concrete."

This idea is certainly more practical, and such a method of constructing a submerged bridge was proposed (vide *Engineering*, May 24, 1889) and worked out in considerable detail by Mr. R. Lilljevist, a Swedish Engineer, for crossing the Sound between Elsinore and Helsingborg to connect the railway systems of Sweden and Copenhagen.

COMPETITIONS.

SOUTH LONDON POLYTECHNIC INSTITUTES.—The following architects have been invited to submit designs in the preliminary competition for the proposed Battersea Institute:—Mr. J. Belcher, F.R.I.B.A.; Mr. C. A. De Boinville; Mr. H. C. Boyes, F.R.I.B.A.; Mr. H. H. Bridgman, F.R.I.B.A.; Mr. T. Chatfeild Clarke, F.R.I.B.A.; Messrs. Henman & Harrison, A.R.I.B.A.; Mr. George Hubbard; Mr. J. M. MacLaren; Mr. E. W. Mountford, A.R.I.B.A.; Mr. Seth Smith; Mr. J. Osborne Smith, A.R.I.B.A.; Messrs. Roger Smith, Son, & Gale; Mr. Sidney R. Smith, A.R.I.B.A.; Mr. E. J. Tarver, F.R.I.B.A.; Mr. James Weir, F.R.I.B.A. The first set of designs are to be drawn to $\frac{1}{16}$ in. scale, and from among the authors of these, six will be selected to take part in the final competition, when drawings to $\frac{1}{8}$ in. scale are to be sent in. The preliminary designs are to be sent in on September 22. Mr. Rowland Plumbe is the assessor.

NOTES.

SIR MICHAEL HICKS-BEACH stated in the House of Commons last week that it did not appear very probable that Parliament would be in a position to legislate further on railway rates this session, so much time having been occupied by the Board of Trade Inquiry. This was, of course, somewhat disappointing to those who were hoping for a speedy settlement of this question, but it is understood that Lord Balfour and Mr. Boyle are actively engaged in considering the evidence and other information gained during the inquiry, and that they hope to complete their two principal schedules by the middle of the present month. These will be based upon the two model schedules submitted by the London and North-Western and Great Western Companies, to whom they will be handed,—in accordance with the provisions of the Act,—for approval or otherwise. It may be taken for granted that such modifications as were agreed upon by both sides after the introduction of the schedules will be given effect to in the revised tables now being prepared by the Board of Trade. The latter are very anxious that their labours may bear fruit this session, but this result depends upon the amount of favour with which their schedules are received by the parties interested. It appears that there is still the possibility that legislation may be proceeded with this session.

THE London County Council, at their meeting on Tuesday last, abandoned the Strand Improvement Bill. The first attempt by this body to carry through an important and urgently-needed metropolitan improvement has thus ended in failure. That the improvement will be made sooner or later cannot be doubted, but, at the same time, this failure is not to the credit of the existing Council. By introducing the principle of betterment in the Bill, they risked the carrying through of a much-needed improvement. If the principle is to be adopted, it must be adopted in all the cities of the kingdom, and should be established by a general and not by a local Act. If the County Council had proceeded on well-known lines, and had made use of the experience and intelligence of able and well-known surveyors, they might have been in a position to make the Strand improvement question a creditable one for their administration, instead of having to admit that the first attempt is a failure.

AS will be seen by our report of the meeting of the London County Council, that body has adopted the recommendations of its Building Act Committee as to the emoluments and *status* of District Surveyors to be hereafter appointed. As we said a fortnight ago, we doubt the wisdom of these changes, especially in the absence of any adequate attempt to re-cast the Metropolitan Building Act. From all that we can hear, some of the District Surveyors are themselves partially to blame for the outcry that has been raised against them as a body. Even Councillor Edis, who made a most able speech in defence of the District Surveyors, was constrained to admit that the system of "devilling" was felt to be a crying evil by many architects, builders, and building owners, who were willing to argue a point with a Surveyor, but not with his clerk. Other defenders of the District Surveyors urged that the dead-set which has been made against those officials in many quarters is due to their determination to see that the law is enforced without fear or favour,—that, in short, the opponents of the District Surveyors are those who have broken the law or have been baulked in attempts to do so. There is no doubt something in this view of the case.

IN the July number of the *Nineteenth Century* Mr. James Knowles, the editor, contributes a short and forcible article combatting the idea of adding a monumental chapel to Westminster Abbey, returning to the proposition he has formerly supported, that there is plenty of space in the cloisters for memorial-tablets, and that the cloister is really an integral portion of the Abbey and shares in its associations, which of course no new monumental erection, tacked on in modern times, could be. Referring to the objections previously made, that the cloister wall space was already fully occupied, he gives a sheet of elevations of the four cloister walls, showing the position and size of all the existing tablets, and showing that there is actually three-fourths of the cloister wall space unoccupied: "about 1,700 superficial feet are covered by existing monuments, and more than 5,000 superficial feet are vacant. This is more than three times the total wall-space of Poet's corner!" It may be partially objected to this that many of the present tablets are so placed as to cut up the wall space into a number of small irregular patches not very available for additional tablets; but this is only the case in a minority of the bays. Mr. Knowles's article and illustrations are exceedingly well-timed, and appear to us conclusive against the necessity or reasonableness of adding a modern chapel to the Abbey, even apart from reasons of sentiment which point against such a proposal. It may be asked, if Mr. Knowles is so clear on the subject, why did he give so much space in his magazine to the preposterous proposals of Mr. Shaw-Lefevre, who is one of the least competent persons that could be found to deal with such a subject?

IN connexion with the Architectural Exhibition to be held at Turin in September, the municipal authorities of Berlin have been formally requested to sanction an exhibition of models, drawings, &c., of such public works in the capital as have been erected under their supervision during the last ten years. After due consideration of the question, the authorities have determined to send the plans and elevations of a certain number of lately-completed buildings, but will abstain from sending in any models. Has our County Council received any similar request from the Managing Committee at Turin? If so, we hope that the visitors of this exhibition may see English work better represented than those did who entered the hall of the "exhibition of works pertaining to the housing, &c., of criminals" held at St. Petersburg last month, in connexion with the "Congress," and at which, we hear, England had but a poor show in comparison to Germany, Austria, Italy, &c., not to speak of France.

THE Report of the British School at Athens, read at the annual meeting on Wednesday, gives a most satisfactory account of the work that has been done, and it is very gratifying to learn from the report of the Director, Mr. Gardner, that though we were late in the field the British School at Athens is twice as numerously attended as any of the others. Mr. Gardner gave an account of the work carried on by various gentlemen connected with the school, Mr. Loring, Mr. Bickford Smith, Mr. Schultz, Mr. Barnsley, and others; Mr. Tubbs read his report of work at Cyprus, and Mr. Loring that on his work at Megalopolis. The unsatisfactory part of the matter is the want of adequate assistance in the way of funds towards all this interesting work of exploration, which may be said to be carried on in the teeth of absolute poverty of financial means. Surely, for the credit of England, some public money should be voted to assist in these explorations, carried on with so much spirit, and which are so valuable in an artistic and historical sense.

THE competition for a "Soldier's Monument to the deceased Emperor William," to be placed on the summit of the historical Kyffhäuser, has been decided this week, and we again find the talented "monument specialist," Herr Bruno Schmitz, the winner of the first prize, this time with a Mediæval tower-shaped erection, placed on a scheme of terraces, and brought into connexion with an equestrian statue of the Monarch who is to be memorialised, together with a legendary representation of King Frederic Barbarossa sitting in an open niche. Although very fair prizes were offered, this competition was by no means of a high standard; of the twenty-eight designs sent in some showed most wretched work, both in composition and technique, and one or two (especially design No. 4) might have been thought to have emanated from a lunatic asylum. The designs classed second and third are both based on a similar idea to that of the first one, and the outward resemblance of these three pieces of work will be sure to strike most visitors. A characteristic incident in connexion with the competition is that the young Emperor, on the 24th inst., visited the hall in which the competition designs had been placed for inspection by the jury, and that, after spending some time in examining the models and drawings, he called the members of the jury together and gave these gentlemen his ideas on the subject, going so far as to even mention those designs which, according to his view, alone merited consideration. As in Germany it is still pretty well the case that the Emperor's word is law,—people may grumble, but they do not run counter to edicts from high places,—it may be imagined how far the jury were likely to be unfettered in their choice. We may certainly congratulate ourselves that we are emancipated from this kind of thing in England.*

THE annual "Academy Exhibition" of Berlin, held this year in the well-lighted buildings of the Landes Ausstellungs Park, was opened on Sunday last, the private view having taken place the afternoon before. This exhibition has, since the organisation of a similar one at Munich, been by no means a fair representation of German art, the works of South German artists being very scarce in comparison to those of the North Germans, and more especially the Berlin School, who are here master of the situation as regards quantity, although, as is well known, they are not in the same position as to quality. The proportion of the works sent in for consideration to those afterwards accepted was as four to three, and it is to be feared that the jury thought more of filling the extensive wall-space than of securing a high standard of work. The catalogue shows 1,549 numbers, of which 1,016 are oil paintings, 260 water-colours, 181 sculptures, 66 black and white, and only 25 architectural. There may be some consolation for English architects in knowing that the German architectural room is here treated in a far worse way than our London one, the few designs being hung in a kind of secondary connecting passage between two halls; but even this position is too good for the wretched show of designs. Of the 25 numbers in the room, eight are appended to various church designs by Professor Otzen, whose style we had occasion to see this spring; these have their merits in regard to design and drawing, though few English architects will admire their style. Only one other sheet is worthy of special mention, and this is the one signed by Prof. Schäfer and Reg. Baumeister Hartung, on which we find the elevation of a very original design for a private residence.

THE Lineff system of electric traction, for tramways and railways, is now being shown in operation on a short length of line laid down at the depôt of the West Metropolitan Tramway Company, Chiswick. The great difficulty hitherto experienced in propelling tramcars by electric power, has been that of getting the power into the car. A motor is geared directly to the wheels, and

*Since this comment was written, we hear that the Special Committee of Members of the Reichstag has just decided that both choice of site and form of monument should be left entirely to the Emperor. The leader of the Opposition, Herr Richter, wished to have the opinions of competent judges laid before Committee; an animated discussion ended by the above decision receiving 13 votes to 1.—So much for art and autocracy!

current is supplied to it in one of two ways: secondary cells can be placed in the car itself, and an ordinary track used, but the cost of working such a system is high, owing to the great weight of the cells which have always to be carried, and the delays caused by the re-charging that has to be done two or three times a day; in other systems, a dynamo-machine is placed in some convenient position, and the conductors from it carried overhead, or underground, like telegraph wires, a sliding contact attached to the car pressing against the conductors and leading the current to the motor in both cases. The objections and risks inevitable with overhead wires are self-evident; and a continuous slot in the road, into which the contacts from the car dip, to touch the conductors, is hardly less objectionable, as water and mud are constantly getting into the channel. The special feature in the Lineff system is the ingenious means by which the current is conveyed to the motor in the tramcar. One terminal of both the dynamo and motor is connected to the ordinary rails,—that is, an earth return is used; the lead from the other terminal of the dynamo is a bare cable laid in a trough of earthenware, or other suitable insulating material, sunk below the level of the road in a channel, running parallel to, and a few inches from one of the rails. On the top of the bare cable lies, in contact with it throughout its whole length, a flexible ribbon made of short lengths of hoop-iron rivetted together. Recessed into the road immediately above this ribbon are plates of iron a few inches across and 3 ft. long, placed end to end, insulated from one another, and with their upper surfaces exposed in the road. The tramcar carries a powerful electro-magnet, with its two pole pieces placed immediately over the iron slabs, and so far apart that the poles are always over two of them, these latter become magnetised by induction, and pull up the hoop-iron into contact with their lower sides. As, therefore, the car passes along the track, the pieces of iron immediately under it are in direct metallic connexion with the conductor from the dynamo, and the current is taken to the motor by travelling brushes attached to the two ends of the car, and resting on the iron in the roadway. Nothing could be much simpler than such an arrangement, and it will be interesting to see how the system will work on a longer track. In wet weather there will evidently be considerable leakage over the surface of the road, and should water get into the channel containing the conductor it seems as though it would be fatal to successful running.

THE London Overhead Wires Bill was defeated last week by a majority of three; it is surprising the majority was not larger. To seek to give new and rather despotic powers to companies for the fixing of posts and wires on private houses, at a time when it has become obvious that the reign of overhead wires must shortly be put an end to, seems a somewhat preposterous piece of legislation.

A PLAN has been prepared by Mr. Joseph Boult, a well-known Liverpool architect, for a special harbour and breakwater near the north end of Liverpool Docks, to allow of first-class ocean-steamers landing their passengers and cargoes without the intervention of "tenders." It would no doubt be a great convenience, but how would it affect the scour of the river and the tendency (already formidable) to the further development of the bar at the mouth of the Mersey?

WE have previously referred (May 17, p. 353) to the various new waterway communications now being planned in Germany. We purposely avoided mentioning the Berlin Sea Canal scheme which has been often talked about, and has of late been busying some minds, chiefly though from the theoretical technical point of view, whilst the financial side has been somewhat neglected. Now, however, that the idea of this "sea canal" seems to be gaining ground, and is likely also to afford interest to non-German engineers, it may be well to mention that those working out the question have, as yet, not been able to come to a definite conclusion as to the advisability of having a connexion direct to the North Sea on the one side, or direct to the Baltic on the other, and that hence a working out of special routes has only to be done in a rough form. As far as we can ascertain, the most competent judges are in favour of but one route,—from Berlin by Eberswalde and Stettin to the Baltic,—rather than the two ways of reaching the North Sea, *i.e.*, either viâ Harburg or viâ Homburg. To give an idea of the dimensions of the scheme, it may be mentioned that the Berlin-Baltic Canal would be some 158 km. in length, and would cost some 8,000,000*l.*; that a canal viâ Homburg would have a length of some 273 km., would require the removal of 115,000,000 cubic mètres of ground, and is estimated at 12,000,000*l.*; and that a similar canal viâ Harburg, 269 km. long, with a removal of 145,000,000 cubic mètres, would require some 14,000,000*l.*

WE understand that the Metropolitan Railway Company have purchased Wembley Park, between Neasden and Harrow, and are about to build a station there, and "develope" the property for building purposes. The position of the Metropolitan Railway differs in one respect from that of any other line in the kingdom, for this railway has a "surplus land stock," the dividends on which arise from rents and profits on the sale of so-called surplus lands. It is a little difficult to understand how Parliament came to sanction the taking of so much land, which could never be required for the purposes of a railway alone, or allow powers to be inserted in the Act to enable the Company to purchase property for building purposes. The fact is, that the Metropolitan Railway is not only a railway company, but also a land company. In the colonies it has not been uncommon for grants of land to be made to railway companies, but the practice has never been usual in this country; but as railway enterprise has in England but little new ground open to it, the instance of the Metropolitan Railway is of little value as a precedent, and is rather a curiosity of railway law and practice than anything else. But the shareholders in this line may be thankful that the promoters obtained the extensive powers in this respect which they did, for it was only by means of the surplus land that this line paid dividends of four and five per cent. before the division of the stocks into railway ordinary and surplus land stocks.

NOTHING is more noticeable at the present time than what may be termed the competition of watering-places. A short time ago we took note of the fact that the authorities at Eastbourne had established a system of sanitary certificates for lodging-houses. We have now to record the fact that last week the Corporation of Scarborough opened, under the auspices of the Duke of Clarence, the new sea wall, promenade, and gardens, on the north side of the Castle Hill. This is a work which the inhabitants may well regard with satisfaction, being not only an attraction to visitors, but a solid and permanent piece of engineering work, which will primarily serve to prevent the encroachment of the sea. Those who prefer nature to art will hear with regret that it is proposed some day to continue this work round the head, and so connect the north and south parts of Scarborough by one sea wall and promenade; for the ragged bit of head to the north of the harbour is about the only piece of nature to be found in Scarborough itself. However, there is plenty of fine, unconventional scenery in the valleys and moors at the back of Scarborough and along the coast-line for those who dislike the madding crowd; and it must be admitted that the constructive and sanitary state of Scarborough well justifies the local pride of its inhabitants. They have only to follow the example of Eastbourne, and have the lodging-houses certificated for sanitary purposes, to still further increase the popularity of the place and its healthfulness as a seaside resort.

YET another of the City churches is marked for speedy destruction. All Hallows-the-Great-and-Less, in Upper Thames-street, has remained closed during some while past, by order, we gather, of the Commissioners of Sewers, who found that the substructure is in an unsanitary condition. We read in the *St. James's Gazette* that, pending the result of a commission already issued by the Bishop of London for uniting these two parishes with one adjoining, the necessary works will not be undertaken; and there is every likelihood that this church will not survive, following in the fate of its former neighbours St. Michael Queenhithe and St. Mary Somerset. It was built by one William Hamon, mason, says Hatton, after the designs of Wren, at a cost of 5,641*l.* 9s. 9d., and was completed in 1683. "The interior of the church," writes the late George Godwin, "is neither square nor parallel, resulting probably from the endeavours of the architect to use such of the old walls as were available; nor has it much architectural character. . . . . The exterior has no feature of beauty or interest: the square massive tower, crowned by a cornice and open parapet, was probably intended to receive a spire at a future opportunity, and has an unfinished appearance about it." The tower has since been pulled down to widen the thoroughfare. The altar-piece is decorated with a Corinthian order, and has stone figures of Moses and Aaron. Another stone figure of Gabriel supports the communion-table. The church contains a carved oak choir-screen, with two side pediments and a larger central pediment, which bears an eagle and the Royal arms. This fine piece of work was made in Hamburg, and given, it is believed, *temp.* Queen Anne, by some Hanse merchants in commemoration of their former settlement in the neighbouring Steel-yard.* The organ was built by Glyn and Parker. Boyce was for some years organist to this church.

THE sale of Gibson's "tinted Venus" on Saturday last at Christie's, does not appear to have attracted much notice; it went for 1,837*l.* 10s., not much of a price for a work which was once regarded as the leading production of the leading English sculptor of the time. We had not an opportunity of seeing it on this occasion; but if it is, as the *Times* description gives it, coloured only in the hair and eyes and parts of the drapery, the colour on the nude parts of the figure must have faded; it certainly was there once, a very delicate warm stain, just suggestive of flesh-tint, and not obscuring the crystalline surface of the marble. That the nude portions of a statue should not be left raw white marble, but be artificially warmed in tone by a stain, was one of the points on which Gibson strongly insisted, and he would certainly not have made such a blunder as to colour the hair and eyes of a statue left otherwise in the raw marble. The statue was bought, it is said, for Messrs. Pears, the well-known soap manufacturers. *Sic transit gloria!*

THE paintings by the Russian artist, Ivan Aïvasovsky, now on view at the Goupil Gallery in New Bond-street, are undoubtedly powerful in their way, but it is not a good way. They are mostly landscapes and sea-pieces giving peculiar effects of light and colour, many of which savour more of scenic effect than of the study of nature. The two coast views at Biarritz (Nos. 1 and 4) are among the best, and two studies of calm sea with cumulus clouds hanging over the sea in piled-up masses, are fine and less stagey than others of the paintings. The shipwreck scene, "The Supreme Moment," is indeed tremendous in its way; but waves on such a scale as this (having reference to the size of the masts, &c., of the sinking ship), were

* For "The Hansards of the Steel-yard," see the *Builder*, October 27, 1888.

never seen in the modern period of this planet, except perhaps in the case of the waves developed by the earthquake and eruption of Krakatoa.

THE President of the Royal Institute of British Architects (Mr. Alfred Waterhouse, R.A.) has issued cards for his *Soirée* at the Natural History Museum, South Kensington, on Tuesday next, by permission of the Trustees of the British Museum. Judging from the programme, and from recent *conversazioni* of learned societies which have been held in the same building, the Institute *Soiree* is likely to be a great success.

LETTER FROM PARIS.

THE two rival Salons have closed their doors, and the Palais d'Industrie is already undergoing the necessary transformation for an approaching Industrial Exhibition. The Palais des Beaux-Arts remains for the present awaiting what will be done with the whole Champ de Mars site. Many persons still regret very much the decision to retain the comparatively ephemeral and showy buildings at the lower end of the Champ de Mars, which have only a temporary interest or utility; and think it would have been far preferable to preserve only the more monumental and architectural buildings of the Palais des Beaux-Arts and Palais des Arts Libéraux, which would moreover have grouped admirably with the Palais de l'École Militaire, one of Gabriel's best works. On the other hand, every one will be pleased to see the proposed transformation of the Champ de Mars area into a great square ornamented with statues, the formation of which will have the effect also of raising the status and value of some of the adjacent habitable quarters of Paris.

The Ministry of Fine Arts has been occupied with the annual awards to artists, and M. Antonin Proust, acting as champion of the new Salon, has fulfilled his intention of demanding that the funds for the travelling studentships and the Prix du Salon should be applied indifferently to both Salons. Naturally such a proposition has met with some strong opposition by those who urge that the Société des Artistes Français has for some years past rendered great services to art, and to artists in need of assistance; and in the end this view has prevailed, and, in spite of M. Proust's protestations, the funds for the awards above referred to are to be entirely retained, as formerly, by the old Salon. M. Félix Charpentier has obtained the Prix du Salon. He is a young sculptor, author of a group, "Les Lutteurs," which has been much admired this year. The municipality purchased from him, some years ago, the marble fawn which is now in the Parc Monceau.

The travelling studentships in Architecture have been awarded to M. Alphonse Conin, M. Chas. Breffendille, M. Fernand Dupuis, and M. Emmanuel le Roi. An active campaign has been made this year by the landscape-painters for the Médaille d'Honneur in painting, which has been successful, and the medal has been awarded to M. Français. This is the first time a landscape-painter has obtained this honour, which was never awarded to either Corot, Daubigny, or Dupré. M. Français is the senior French landscape-painter now living, being seventy-five years of age. He exhibited this year a "Vue de la Sèvres à Clisson" and "Matinée Brumeuse." He is not only an artist of considerable power, but esteemed also as a man of very generous character, and who has been a friend to many artists in distress. In sculpture no medal of honour has been awarded.* In architecture M. Redon has carried off the medal by 41 out of 71 votes.

The Committee of Painting has also awarded two special prizes, the one founded by the Raigecourt-Goyon family in memory of the late Comtesse de Goyon, and the other by Marie Bashkirtseff, the young Russian artist who died two years ago, and whose remarkable posthumous memoirs have given her more fame than she lived to acquire by her paintings. The first of these prizes has been awarded to M. Armand Guéry, the second to M. Paulin Bertrand.

Among noteworthy exhibitions is that of the etchings of Chaigneau the animal painter, in the Boulevard Poissonnière, and that of a painting by Roybet in the Georges Petit Gallery. The latter has attracted great attention during the month by the power and originality of the one work, and the painter's absolute disconnexion from the current fashions of painting. The painting represents Charles the Bold at Nêsle, commanding the massacre of the populace who had taken refuge in a church. This painting of a scene of carnage is a masterly work, showing artistic qualities of the highest order, but it is confused in effect for want of a sufficiently marked central point in the composition.

The Company of the Chemin de Fer de l'Ouest has made a happy innovation in decorating the large hall of St. Lazare station with a series of oil and water-colour paintings of the watering-places of Normandy and Brittany. These are painted by M. Eugène Bourgeois, a young artist who has often exhibited in the Salon, and they form a welcome contrast to the vulgar transparencies exhibited by the company last year.

M. Antonin Proust, who must be credited with a real if not always well-directed zeal in matters artistic, has proposed to the Chambers the formation of a museum fund (Caisse des Musées) to facilitate the purchase of works for museums in Paris and in the provinces. The fund would be administered by an honorary committee presided over by the Minister of Fine Arts, and would receive an annual grant of 500,000 francs. Anything not expended in one year would be carried over to the next, so that an accumulation might be formed which could be utilised on occasion to secure for France important works, which might otherwise go out of the country. This proposition, supported by a strong group of Deputies, will shortly come under discussion.

The Louvre continues to receive new contributions; the last was a very fine portrait by Ricard, left to the Museum by the late M. Heilbuth, who also left to it one of the best of his own works. This, however, according to the rules of the Louvre, will have to be deposited in the Luxembourg until the expiration of the ten years which constitute a deceased painter an "old master." There has also arrived at the Louvre a very fine example of Corot, not from the Luxembourg, but from the Château of Compiègne, where the "Direction des Bâtiments Civils" had forgotten it.

Among the works now going on at the Louvre is the preparation for definitely installing the Dieulafoy collection in the Gallery of Persian Antiquities. This gallery, which has been decorated by MM. Rude and Chaperon, will contain among other curiosities the reduced model of the Assyrian Palace, the Apadana, which was exhibited in the Palais des Arts Libéraux last year.

A new gallery of casts has been opened in the museum of comparative sculpture at the Trocadéro. This gallery, the contents of which are of the highest interest, occupies the west wing of the Trocadéro palace, given up last year to the interesting loan collection of Mediæval art. The contents of the completed gallery of comparative sculpture, in the east wing, were described at some length in an article in the *Builder* of August 10, 1889. The new collection in the west wing is arranged as follows: it is divided into six compartments, symmetrical with those of the opposite wing. The first five are devoted to works dating from the eleventh to the eighteenth century. The sixth compartment is devoted to specimens of Cambodian architecture and sculpture brought home by the Delaporte mission. The compartments are divided by reproductions of ancient gateways, which were already in place there last year, and were described at the same time as the contents of the east gallery.

This installation in his building ought to be a satisfaction to M. Bourdais, the architect of the Trocadéro; who however is not happy, because the neighbourhood of the Eiffel Tower will not let him rest. He also had his scheme for a 300 mètre tower which has not been accepted, and in despair of that, he is now exhibiting to the tradespeople of the Palais Royal a design for a tower 100 mètres high in stone and crystal. This new edifice, which no one wants, he proposes to construct at one end of the Palais Royal, with all the apparatus of restaurants, fountains, and coloured lights in connexion with it. He urges that this will give new life and prosperity to a quarter now almost deserted as far as evening amusements and fêtes are concerned. It is not likely however that M. Bourdais' tower would do much to avert what seems the tendency of all Parisian life to flow westwards.

This same westward tendency has increased so much that this quarter of Paris is getting inconveniently crowded, being, so to speak, compressed against the old fortification line; and the deputies of Paris, with M. Georges Berger at their head, have renewed the representations to the Minister of War, made already in 1883, for the entire removal of the fortifications. Several changes of Ministry have taken place without the matter being advanced, thanks to the *vis inertiæ* of the military mind. While it is recognised now that these fortifications do not in any way meet the requirements of works to stand against modern artillery, and that since the construction of the new forts they are really of no use, still the Comité Supérieur de Défense puts its veto on all attempts to remove them.

This time however there seems some chance of success, as one of the promoters of the attack on them, M. Guyot, is now Minister of Public Works, and his assistance therefore may be counted on; and the demand now made is not for the dismantling of the whole, but only for the portion between the Seine and St. Ouen. The river takes at this point a curve parallel to the line of the fortifications, and constitutes a natural defence protected by the forts of Issy and Valérien; and by removing the fortifications at this point the limits of Paris would be extended to the river. This operation would give an area of 430 hectares* where the population of Paris could find new and healthy and cheap sites for habitations. This is therefore a matter of great interest in regard to the threefold question of hygiene, construction, and public economy; and the Minister who can get round the routine of the military engineers will earn the thanks of Paris.

The candidates for the place in the Institut left vacant by the death of Robert-Fleury are M. Français, M. Détaille, M. Emil Lévy, M. Joseph Blanc, and M. Jules Lefebvre. The Académie has added to these names that of M. Benjamin Constant, M. Olivier Merson, and M. Harpignies. The Académie des Beaux-Arts has also to fill the vacancy in the ranks of its corresponding members left vacant by the death of Mr. Herbert. The following candidates were proposed: Mr. John Burn; M. Pradilla, of Madrid; M. Kroyer, of Copenhagen; Mr. Herkomer; and M. Valbez, of Stockholm. Mr. Herkomer was elected.

The Academy has proposed M. Eugène Guillaume to the Government, to succeed M. Hébert at the Villa Medicis, the term of office of the latter artist expiring on January 1 of next year.

The École des Beaux-Arts has just decided the competition of the first class in architecture, the subject being "a palace of national archives." Among seventy-six designs, second medals were awarded to M. Monjauze (pupil of MM. Gerhardt and Rédon), M. Duquesne (pupil of M. Pascal), and M. Baille (pupil of MM. André and Lalou).

M. Roger Ballu, the son of the eminent architect, has been named a member of the Committee on Works of Art, in place of the late M. Ph. Burty, who recently died suddenly of apoplexy. He was one of the most able art critics of the day and one of those whose word had most weight. He (like a good many other critics) commenced as a painter and gave himself up subsequently to art criticism, to which he brought rare faculties both of style and judgment. He was a contributor to many reviews, French and foreign, and besides published a good many separate treatises. He was Chevalier of the Legion, Inspector of Fine Arts, and Member of the Committee of the Société des Gens de Lettres; and was also a great collector, with a passion for Japanese art, which he did much to popularise.

THE ROYAL SCOTTISH ACADEMY, EDINBURGH.—Mr. William McEwan, M.P., has given 5,000*l.* to Sir William Fettes Douglas, President of the Royal Scottish Academy, for the purchase of a picture or pictures for the Scottish National Gallery. It has been, for some time, the desire of Mr. McEwan to procure for the gallery an example of Rembrandt, and it will be the endeavour of the President to secure a work of that master.

WAGES IN THE BUILDING TRADE AT HANLEY.—At a meeting of master builders, in Hanley, on June 26, it was resolved to grant an advance of wages of ½d. per hour.

---

* We cannot avoid expressing our astonishment at this result. Most English critics, we believe, would consider that landscape in the Salon was rather weak this year, and the sculpture incontestably the finest portion of the Exhibition.—ED.

* One hectare = 2·4736 acres.

THE MONTPELLIER BATHS' COMPETITION, HARROGATE.

THE action which the Corporation of Harrogate is taking in extending the bathing accommodation of the town is one for which there is every need; and as the steady increase in the number of bathers has rendered the accommodation of the Victoria Baths quite inadequate, the Corporation has decided to build premises containing vapour, air, and douche baths; cooling, pulverisation, and inhalation rooms; Turkish baths and massage-rooms; with spacious Winter Garden and concert-room attached. It is intended that the new building should provide a bathing establishment surpassing all others in excellence.

In the competition which has just been decided, every effort has apparently been made to secure impartiality, and the result may be considered satisfactory.

The plans which have been accepted are likely to provide the town of Harrogate with buildings designed with every care and consideration for the objects in view.

The competition was divided into preliminary and final portions, and out of the authors of the twenty-six sets of sketch-designs four were selected to prepare more elaborate designs.

The Assessor, Mr. Corson, of Leeds, completed his scrutiny of the four sets of designs, and awarded the order of merit as follows:—Messrs. Baggallay & Bristowe, London; Messrs. T. & F. Verity & W. Phipson, London; Messrs. Ellison & Son, Liverpool; Messrs. Morley & Woodhouse, Bradford.

We are entirely in accord with Mr. Corson's decision, and careful examination of the drawings will show that the award is a wise one, and that the best design submitted has every probability of being carried out.

The site is of irregular four-sided shape, and the levels of the surrounding roads vary to a large extent. It is greatly to be hoped that the Corporation will see their way to carry out their suggestion by removing the row of shops occupying a corner of the site; such a step would greatly improve the aspect of the gardens and would give room for a slight expansion of the plan in this region, which would be in several respects most desirable.

The four final competitors have all placed the principal front and entrance in the Crescent-road, and have also wisely confined the building to this side of the site, placing the Winter Garden against this block, so as to occupy a central position on the site and still to leave a considerable space behind to be laid out as grounds.

Many of the other competitors have crowded the site by providing too extensive a Winter Garden.

The preliminary instructions to competing architects deserve a word of notice. The information given was confined to as few leading points as possible, and much was left to the individual ingenuity of the architect. This arrangement is in striking contrast to some instructions, which are but too often a bar to the designing of a really good building.

Messrs. Baggallay & Bristowe, who, by the resolution of the Corporation, have been appointed architects to the building, have carefully grouped their plan around a central hall placed well in the centre of the block and surrounded by doctor's consulting-room, manager and porters' rooms, chairmen's waiting-room, &c. The principal entrance, with dome over, occupies the centre of the Crescent-road frontage and leads straight into one end of the central hall. At the opposite end of the hall, a vestibule, with refreshment and reading rooms on either side, leads to the Winter Garden, running along the back of the building and at right angles to the vestible. In the centre of the gardens and in line with the central hall, an octagonal domed pump-room is placed, with a covered way from the Winter Garden.

The ladies' baths are placed on the left of central hall, and the gentlemen's baths on the opposite side. Each section is approached by corridors at right-angles from centre of hall.

The provision of large areas in each of the last-named blocks gives facilities for external lighting and for placing the water-closets and lavatories against external walls — a point which has not been so ably treated by the other competitors.

One of Messrs. Baggallay & Bristowe's special features is the straight corridor running from Montpellier-road to the central hall. A slight incline from the hall would give easy access for bath-chairs to the central hall, and thence to all parts of the building.

The planning of the building on one floor cannot be too highly commended, and the advantage of this arrangement is at once apparent by comparison with the three other designs, each of which places some portion of the department on a first floor.

The corridor last mentioned, running parallel with the Winter Garden, has pulverisation, cooling, and inhalation rooms on the south-east side, whilst the Turkish bath is placed in the south-east angle, adjoining Parliament-street entrance and Winter Garden.

The lighting of the Turkish bath will, of course, be from the top, but there is nothing to indicate this on the plans. The steps between the rooms are a questionable advantage, and, we should think, might be easily dispensed with.

The stipulation that the height of dressing and bath-rooms be not less than 15 ft., has been taken advantage of to give external light over the corridors, which have been kept low, and this treatment has been most successfully carried out by Messrs. Baggallay & Bristowe. The competitors have, without exception, adopted a Renaissance style. Messrs. Baggallay and Bristowe's treatment is fairly successful. Domes form prominent features, and the square towers rising from the centre of the building are gracefully designed and serve a double purpose in the position assigned to them, being used for storage tanks and for smoke and ventilation shafts.

It is to be hoped that in the execution of this building some decided effort will be made to introduce colour into the elevations; the dull aspect of the buildings of Harrogate built with the local stone is most conspicuous and depressing.

The designs placed second, prepared by Messrs. T. & F. Verity and W. Phipson, of London, deserve all credit for the care with which they have been drawn, and for the grace of the elevations. The plan, though good in parts, cannot, however, be compared to the simplicity of the plan of Messrs. Baggallay and Bristowe. The corridors are involved, and are not straight from the central hall. Advantage has been taken of the height, previously mentioned, of the baths and dressing-rooms, but the advantage gained by placing the water-closets, lavatories, and urinals against external walls, even though of internal areas, cannot be too much insisted upon, and the expedient of closets opening direct from dressing-rooms is a questionable one. The areas provided are much too small for their purpose.

The provision of some portion of the establishment on the first floor is a disadvantage. Messrs. Verity provide ladies and gentlemen's reposing-rooms over the entrance, and a gallery surrounding the central hall leads to massage-rooms on each side. A large staircase gives access to this portion of the building from ground floor.

The elevations are distinctly the best part of this design, and are far in front of the two remaining designs in every respect.

The design placed third, submitted by Messrs. Ellison & Son, of Liverpool, differs from the two previous ones in several important respects, and though the elevations cannot be commended, the idea of the plans has been methodically worked out.

Unlike the others, Messrs. Ellison & Son have placed the principal entrance at the corner of Crescent-road and Montpelier-road.

A feature of this entrance is a covered carriage shelter, with double doors at each end for closing, if required for special cases, and a long incline for bath chairs.

A large hall behind the entrance has staircase and lift on right-hand side, and on the left two straight and parallel corridors branch off towards Parliament-street, and parallel to Crescent-road (which is straighter than its name implies). A large area between them gives the necessary light and air.

The Turkish bath has been placed in the Crescent-road front, and the rest of the space is occupied by the gentlemen's bath.

From the second corridor already mentioned, a corridor at right angles leads directly into the Winter Garden, which is at right angles to the block, and runs across behind the existing shops in Parliament-street. The pump-room has been placed in the centre of the Montpellier-road front, and a covered colonnade runs from this point in front of the Winter Garden. The design of this colonnade is exceedingly poor.

The first floor, approached by staircases and lift, contains the ladies' baths. The corridor has been extended at great trouble, and carried through to form a communication with the gallery of Winter Garden. The advantage of this is not very apparent.

Smoking and billiard rooms are provided on this floor, but we cannot admire the arrangement of reading and writing rooms leading out of one another, and ultimately to a lavatory, urinal, and water-closet, to which there is no other access.

The position of the tower at the corner of Crescent and Montpellier-road cannot be said to improve the design.

The detail of this design is disappointing; the stone ballusters to parapet are especially weak and poor in character.

The elevations of the design submitted by Messrs. Morley & Woodhouse, of Bradford, are in some respects of better character than those of Messrs. Ellison & Sons. The frontage to Crescent-road is very flat, and sadly needs relief. The provision of a carriage shelter is a good suggestion, though examination of the existing shelter to the Victoria Baths shows that the use of this accommodation is almost entirely ignored by both visitors to the baths and drivers.

Messrs. Morley & Woodhouse have set their lines of frontage back from the road some distance, and if this would save some of the trees which abundantly cover the site the thanks of the inhabitants would have been gained.

The entrance, in the centre of Crescent-road, leads directly into a waiting-room or lounge, and a cooling-room. From the latter the ladies' and gentlemen's baths are reached, and the inhalation and pulverisation rooms intended for the use of both sexes. The Turkish baths have been placed in the corner by Parliament-street, with separate entrance from the grounds.

The Winter Garden is placed at the back, parallel to Crescent-road, with large pump-room at one end, occupying the centre of Montpellier-road.

A tower at the corner of Crescent-road and Montpellier-road adds but little to the harmony of the design.

The arrangements for ventilation and drainage are but barely indicated upon this set of plans. This is in striking contrast to the fulness of details given by Messrs. Baggallay & Bristowe to these most important points.

The sketch-plans which were submitted, but never developed, are not without interest.

A very bold design may be mentioned, with the entrance at the corner of Parliament-street and Crescent-road. An octagon hall, with elliptical waiting and reading-room behind, ultimately leads into a central pavilion of the Winter Garden, with semi-circular colonnades on each side. The disposition of the baths behind the circular colonnade, and facing Crescent-road and Parliament-street, is thoroughly original.

The decision of the Assessor, Mr. Corson, will be endorsed, we think, by all who will bestow upon these designs a careful examination.

A SMOKE ANNIHILATOR.

ACTS of Parliament have been passed and fines inflicted for the production of smoke nuisances, but for all that smoke prevails; and the prosecutions are not actively waged, mainly because—if the truth may be spoken—it is tacitly admitted as rather hard, if not actually unjust, to fine for a nuisance when the offender cannot be directed to any certain or efficient remedy. Good stoking has so far been the best remedy, but as good stokers cannot always be relied upon, there is need for some reliable mechanism which will neither tire nor fail in its operation. In the pretty country town of Newbury, in Berkshire, an important industry has recently sprung up in the wood-joinery establishment of Mr. S. Elliott, where a large amount of admirable artistic work has been turned out, and which has already gained gold medals from five public exhibitions of note. Steam power had to be employed for these works to dry the wood and drive machinery. The saw-dust, shavings, and other waste had to be got rid of, and the easiest and cheapest mode of course was to burn them as fuel. The inhabitants objected to this process, and the energetic proprietor was fined. It was not to be expected he would cease the consumption of this class of fuel, but it was not

The Old Church House, Chelsea.

agreeable to be in antagonism to his neighbours. So Mr. Elliott struck out a course for himself—an original, simple, and effective one. He seizes the black smoke as it comes away from the furnace, and washes it clean before he lets it go into the atmosphere. To do this, he stops the smoke in the chimney by a trap. He then draws the smoke away by a rapidly-revolving fan and delivers it into a closed tank of water, through a central perforated revolving tube, carrying several beaters which expeditiously commingle the water and the smoke. The carbon and solids are precipitated and the sulphurous and other acids absorbed by the water. The heat of the smoke converts a portion of the water into steam; and there passes off from the tank funnel only the vapour thus caused and the thoroughly cleansed nitrogen and partially consumed air, which has passed through the furnace. This vaporous mixture is absolutely inodorous, and a white handkerchief held in it will neither become impregnated with fumes nor stained by smuts.

A very numerous party of engineers and experts inspected last week the invention attached to a 100 horse-power boiler in Mr. Elliott's works; and all concurred that the apparatus was justly entitled to the name of "smoke annihilator" which the inventor has applied to it. Dense columns of smoke were allowed to arise in the ordinary way from the chimney. Then the apparatus was switched on, and the black smoke ceased, an equal volume of pure white steam supplanting it. This quickly dispersed like the steam from a locomotive on a hot summer day. The carbonaceous and other products may be from time to time removed from the water and applied, if worth the trouble, to some economical purpose. Numerous specimen-boards were shown, painted in various greys, greens, and browns, both in flat and varnished. The carbon thus obtained is exceedingly fine, and may probably be on a par with the finest lampblack. We are not inclined, however, to lay any stress upon the commercial value of these bye-products, which, if turned into the drains, can do no harm and may do good in proportion to the quantities of smoke washed and the amount of materials extracted.

The annihilating apparatus neither occupies much space nor is it costly. The dimensions of the tank in the present instance are 4 ft. in length, 4 ft. 6 in. high, and 2 ft. 6 in. broad. The fan is a small one, adapted to its duty, and runs at about 2,000 revolutions per minute, whilst the beaters run at about 200 revolutions. About 1½ horse-power is probably the extent of steam drawn from the boiler for working the fan and the beaters,—so the expense of running the apparatus is slight. On the other hand, the fan acts as an exhaust to draw through the furnace a regular and good supply of air, and as a consequence the combustion is improved to the extent, as has been tested, of 4 per cent. of the fuel required. Another point is worthy of notice. The iron chimney which was 80 ft. high previously has been reduced by 40 ft. The Mayor and several members of the Corporation of Newbury were present, and gave satisfactory testimony to the local appreciation of the invention. It would be, indeed, a pity if the increasing developments of industries should be incompatible with the retention of rurality by the town; but by this novel smoke-washing process the untarnished beauty of the country and the welcome profits of industry may, seemingly, thrive side by side without antagonism. On shipboard the new process may well receive attention, for the smoke of steamers on the water is scarcely a less nuisance than the smoke of factories on the land—from the smallest launch on the river to the finest "greyhound" liner afloat on the seas. To the naval leviathan and the swift torpedo boat the desirability of getting rid of their smoke is equally obvious and important.

THE OLD CHURCH-HOUSE, CHELSEA.

THE above sketch shows this house, at present used as a Sunday-school, but which we are told is now so much dilapidated that it has been condemned as unsafe. The Rev. R. H. Davies, the incumbent of Chelsea, proposes to rebuild it, utilising as far as possible the original facing bricks on the exterior, and, in fact, re-erecting the face of the old building with a substantial backing. It is hoped that some readers of the *Builder* may be able to contribute something towards this praiseworthy attempt to preserve the soul of an old house, while giving it a more substantial and durable body.*

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS:

MEETING IN LIVERPOOL.

THE annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors was opened in the Town Hall, Liverpool, on Thursday in last week, when a large number of the Association's members attended. There were present:—Mr. H. P. Boulnois, City Engineer of Liverpool, and President of the Association; Mr. George F. Deacon, Water Engineer of Liverpool, and Past-President; Colonel Jones, V.C., Wrexham; Messrs. H. T. Wakeham (Garston), T. Marks (Llandudno), T. C. Thorburn (Birkenhead), J. T. Eayrs (West Bromwich), T. de C. Meade (Hornsey), E. Pritchard, Past-President (Birmingham and Westminster), F. Ashmead (Bristol), Charles Jones (Ealing), Joseph Lobley (Hanley), A. W. Parry (Reading), H. M'Kie (London), A. T. Davis (Shrewsbury), P. S. Platt (Rochdale), E. G. Mawbey (Leicester), J. Cartwright (Bury), Rhys Davies (Brecon, N.W.), J. Haigh (Abergavenny), A. G. M'Beath (Sale), J. Bower (Gateshead), G. E. Eachus (Edmonton), A. R. Window (Liverpool), G. S. Matthews (Dorking), J. P. Norrington (Fulham), N. H. Hopkinson (Keighley), W. H. Savage (East Ham, London), H. Richardson (Oldbury), J. Atkinson (Stockport), W. H. Smith (Carlisle), E. J. Silcock (King's Lynn), W. Spinks (Manchester), J. T. Hawkins (Somerton), R. Brierly (Newton-in-Makerfield), A. E. White (Hull), James Diggle (Heywood), W. Diggle (Kelsall, Chester), Richard Pickering (Whitehaven), H. J. Clarson (Tamworth), T. W. Stainthorpe (Eston, Middlesbrough), P. Edinger (Frome), F. S. Button (Burnley), J. A. Crowther (Nelson), M. W. Jameson (South Hornsey), J. W. M. Smith (Wrexham), Walter Brooke (Richmond), H. G. Coales (Market Harborough), W. Banks (Rochester), W. Welbarn (Middleton), J. Parker (Nottingham), A. T. Gledhill (Heckmondwike), S. E. Thorrold (Redditch), E. R. Hooley (Notts County), R. F. Vallance (Mansfield), A. B. Acworth (Milton-next-Sittingbourne), N. W. Blair (Bootle), R. Thompson (Waterton), F. D. Ward (Liverpool), E. G. Harvey (Ventnor), J. Myatt (Leek), G. E. Shone (Crewe), W. A. Davies (Aston Manor), S. N. Glass (Fulham), Henry F. Marks (Dewsbury), Jesse Clare (Sleaford), C. F. Wike (Sheffield), and John Buchan (Grimsby).

The general meeting of the Association was held in the Council Chamber, and Mr. T. Holder, Deputy-Mayor, in welcoming the members, regretted that the Mayor was absent in London on important business connected with the city. It was a source of gratification to them in that city to know that their respected City Engineer, Mr. Boulnois, was filling the high position of President, and he had great pleasure in asking that gentleman to take the chair.

Mr. T. Cole (Secretary) then read the seventeenth annual report of the Council, from which it appeared that there were now 419, compared with 371 members at the end of the previous year.

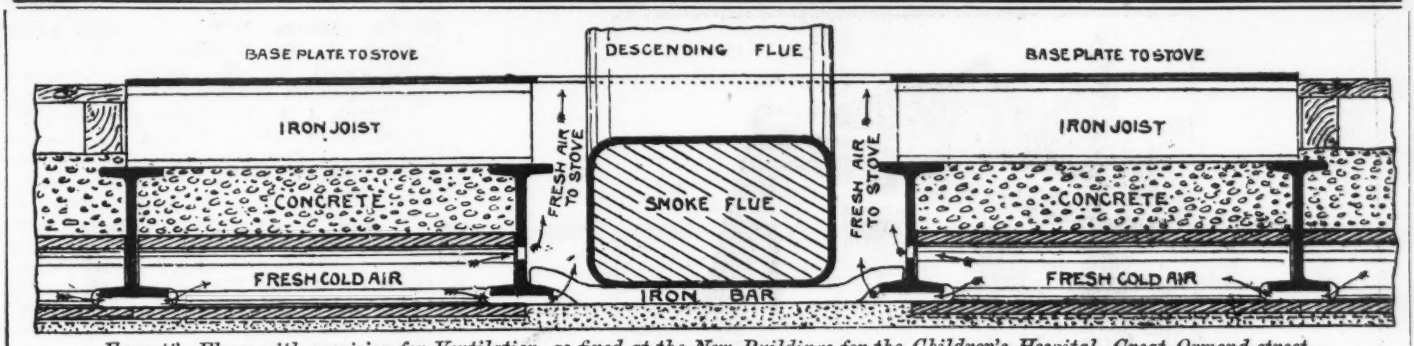
The report having been adopted,

The President said he had much pleasure in presenting to the successful writers premiums which had been voted by the Association for essays on certain subjects. The winner of the first premium of 10*l.* was Mr. E. J. Silcock, King's Lynn, for his essay on "Electric Lighting," and of the second, of 5*l.*, Mr. A. E. White, Hull; these two gentlemen having selected several books as the shape which they wished the premium to assume.

The President's Address.

The President, in his annual address, after thanking the members for re-electing him to the presidency of the Association, referred to the benefit which the members derived from attending the district meetings during the year. The inspection of municipal and other works in the various cities and towns could not but enlarge their professional knowledge, which was, without doubt, of the greatest value to the towns where the members were employed, and he thought that, in justice, some arrangements might be made by the corporations and the boards of the towns that the expense falling on their officers should not be entirely defrayed by the officer attending such meetings. A few corporations had already adopted measures whereby the cost did not fall on the officer, grants being allowed towards his expenses in attending meetings of the Association. He referred to the fact that an engineer's profession was one which depended so much upon the knowledge of what others were doing, in order to achieve complete success and avoid failures in his multifarious duties. In all his duties, however, the meetings of the Association instructed the member. The President then entered technically into one or two questions of engineering work, saying that in water engineering the members had had opportunities of visiting some of the largest works in the kingdom, among them that magnificent feat of modern engineering the Vyrnwy dam and artificial lake, which he was proud to say had been carried out by one of their members, Mr. George F. Deacon. Continuing, the President said he believed their proposed registration and the alteration of their title to that of the Incorporated Association of Municipal and County Engineers would give them even a better position than they now held, and would give them a *locus standi* in many new matters. One of their objects was the promotion of the professional interests of the members of the Associa-

* Subscriptions may be sent to the Rev. R. H. Davies, 178, Oakley-street, Chelsea.



Fawcett's Floor, with provision for Ventilation, as fixed at the New Buildings for the Children's Hospital, Great Ormond-street.

tion, and in reference to that he would like to say something. Sanitary engineering, as a profession, was only forty years old, and at present no diploma was necessary to distinguish a man fitted to hold the post of chief engineer to a corporation from a man who was not fit. Very often a plumber would put after his name the title "sanitary engineer," thus giving a very misleading notion as to what a sanitary engineer really was. If the line of action pursued by the Association was properly supported, the certificate of competency they granted would be regarded as a diploma under which an individual might be recognised as really a sanitary engineer competent to hold municipal office. He was also of opinion that municipal officers should be entitled to a pension after a certain number of years' service. A system might easily be arranged under which a fair percentage of an officer's salary should be placed in a superannuation fund, which could be increased by the corporation or local board out of the rates. Such a system would go far to cement the good feeling which ought to exist between municipal officers and the corporations or boards they served. Manchester had applied for an Act of Parliament empowering them to form a superannuation fund, and the Corporation of Liverpool, which had at present an incomplete Act, under which it did not appear that any pension could be granted to officers who had joined the service since a certain date, although a percentage of their salaries was stopped for the purpose, would no doubt obtain an Act to change such an anomaly. He was also of opinion that officers should be appointed on a sliding scale. In conclusion, the President said he would do all he could to further the interests of the Association.

We will give some further notes of the meeting in our next.

FLOOR SECTION AT CHILDREN'S HOSPITAL, GREAT ORMOND-STREET.

THE accompanying diagram (see above) shows the manner in which Fawcett's fire-proof flooring is being utilised by Mr. C. Barry at the new buildings for the Children's Hospital in Great Ormond-street, as a means of finding space for flues admitting fresh air to the stoves. Mr. Barry proposes to place "Tobin tubes" against internal walls and supply them with air in the same way as the stoves are supplied, through the tubular lintels used in the construction of the fire-proof floors.

Illustrations.

PAVILION OF CATHERINE DE MEDICIS, BLOIS.*

THE Pavilion of Catherine de Medicis at Blois forms a detached portion of the château known as the Tour de Foix situated at the south-west corner overlooking the river and church of St. Nicholas. Together with the Salle des États and the Tour de Donjon, it forms one of the most ancient parts of the castle, and probably dates from the thirteenth century, although the details of the octagonal turret rather resemble flamboyant work. The illustration is from a drawing by Mr. Herbert Railton.

* Some description of this pavilion was given in the *Builder* of June 5, 1847, in the report of a paper on the decoration of Blois and Chambord, by the late Mr. Crace

SHEFFIELD MUNICIPAL BUILDINGS DESIGN.

WE publish this week the perspective view and two plans of the design submitted by Mr. H. T. Hare in the second competition, and on which we have already commented in our general article on the designs last week. Mr. Hare wishes to point out that the general idea of the plan was based upon the conviction that the General Offices of the Borough Accountant and Waterworks Department were of too great area in proportion to their height to be satisfactorily lighted by windows only. They were therefore placed in the centre of the building, with top-lights over the greater portion. A direct entrance for the public was provided from Surrey-street, leaving the main entrance and staircase for state purposes only. The plans are so arranged that the business and state portions of the building may be entirely cut off from each other when required.

The following additional notes from his report are furnished to us by Mr. Hare:—

"The walls were proposed to be faced with Huddersfield stone on the external elevations, the areas being lined with white glazed bricks. The roofs to be covered with green Westmoreland slates. The turrets and tower-roof to be covered with copper. The whole of the construction, both as regards floors and roofs, to be fireproof on Lindsay's system, with trussed steel joists and pumice concrete.

The windows throughout were proposed to be glazed with lead lights in squares, about 6 in. by 9 in., with iron casements when required to open. The windows in the state apartments to have armorial bearings and devices introduced, and to be treated generally in a more ornate manner.

The council-chamber and reception-rooms to be panelled in dark oak and teak to the height of 12 ft. above the floor. The walls in council-chamber to be faced above the panelling with Ancaster stone, and in the reception-rooms to be covered with enriched plaster-work. The floors to be in oak parquetterie.

The entrance-hall and staircase to be paved with mosaic. The steps being in Hopton-wood stone, and the walls faced with Ancaster stone. Polished Nopton-wood stone and various marbles were proposed to be used in dadoes, balustrades, &c.

The ceilings of all the above apartments to be panelled and enriched in plaster.

The large general offices were to be paved with wood-block flooring, and the other offices with pitch-pine in 4 in. widths, secret nailed.

The walls in lavatories to be lined with tiles to a height of 6 ft. above the floor, and above finished in plaster for painting.

The whole of the w.c. apparatus throughout were to be on the "Pedestal" system, without enclosing woodwork, and the lavatories of the "tip-up" type.

The heating was to be by hot-air in the State apartments, entrance-hall, and general offices, the air being drawn down to the basement by a 6 ft. diameter fan from a point above the roofs, and heated in chambers placed as nearly as possible under the apartments which they were to warm. Other portions of the building to be heated by hot-water coils placed, in most cases, in the window backs, with fresh-air inlets into the coil-cases.

The extract ventilation was sub-divided into several systems, the upward currents being assisted in all cases by small hot-water coils.

The estimate was 79,950*l.*, but this amount was not, in my opinion, sufficient to carry out the building in an adequate manner."

SCULPTURE: "VELASQUEZ."

THIS equestrian statue, by the well-known French sculptor M. Frémiet, was one of the central works in this year's Salon. The object seems to have been to give a portrait statue of the great Spanish painter riding on the heavy type of charger-looking horse, represented in his own pictures, and ensconced in the voluminous saddle of the period, which would horrify a modern horseman, but which possibly conduced to that extreme gravity and stiffness of deportment in the saddle which characterises the mounted grandees of Velasquez's paintings.

The figure is characteristic, though the costume certainly does not lend itself well to sculpture, and perhaps we shall not be wrong in concluding that the horse was, after all, the main object of interest with the sculptor.

THE PROPOSED "EIFFEL TOWER" FOR LONDON.

WE give this week an illustration of the first premiated design for this proposed 1,200 ft. tower, by Messrs. Stewart, Maclaren, and Dunn.

The design was accompanied by a full and very well-written report going into the whole subject of the design and construction of the tower. From this we have only space to give such extracts as will sufficiently explain the general intention of the designers:—

Extracts from Report.

"The dimensions of the tower are 300 ft. across at the base, tapering to 40 ft. across at a height of about 1,100 ft.

A structure rising to so great a height must be artistically independent of its surroundings from all points of view except those in the immediate neighbourhood; but its effect would be greatly enhanced from a closer prospect by a suitable base, and we have suggested on the general drawing a screen wall (which might form the façade of the exhibition or grounds of which the tower will be the centre) of sufficient mass and extent to form a proportionate pedestal. Such an adjunct must, however, remain a suggestion merely, until a site is secured, and the general question of its environment determined.

The style of this screen and the tower itself is of an Eastern character, the authors feeling that to be governed by the strict rules of European art would be a mistake. There is, moreover, something allied to Oriental magnificence in the scale and dimensions of the structure. The freedom in design and the richness in decoration which this style permits make it specially suitable for the purpose. . .

In designing a structure of this size, enclosed in a steel frame such as this, the nature of the walling must be considered in regard to the expansion and contraction of the frame. Ordinary brick walls would soon show perceptible cracks, and iron frames covered with iron plates, which would expand in the same ratio as the tower, would be found too cold in winter and too warm in summer for comfort.

The special method which we propose is that of forming the outer walls of three thicknesses of plaster on wire netting fixed to iron studding, forming two distinct air spaces. The outer coating would be of cement, rough-cast, of good colour. . . . The elasticity of these walls would meet any expansion or contraction of the tower; their lightness is of great importance, and the speed and economy with which they could be erected is a further recommendation, for the material would be prepared in the workshop and sent up in large slabs, requiring only a few screws and joints for fixing. As the floors would be constructed throughout of concrete and steel, it will be observed that the structure would be, if not fireproof in the strict sense of the word, eminently fire-resisting.

With the exception of the stair not intended for public use, from the fourth stage to the electric light in the lantern, the whole of the steps are arranged in straight flights, round a central well, without winders.

In the two staircases passing up the legs of the tower to the 200 and 272 ft. landings, a reversal of the direction of turning is made, three times in the height; a provision intended to guard against giddiness from turning in one direction. . . . In the construction of these stairs we propose to use Hawksley's patent treads (formed of small cubes of wood set in iron frames) on iron carriages.

The tower has eight legs from bottom to top, placed so as to form a regular octagon in plan. The whole of the steelwork is to be made in the Siemens-Martin 'open-hearth' system, and is to have an ultimate tensile strength not less than 30 tons, or more than 33 tons per square inch of section, with an elongation of at least 20 per cent. on a length of 8 in. The precautions now usually adopted in

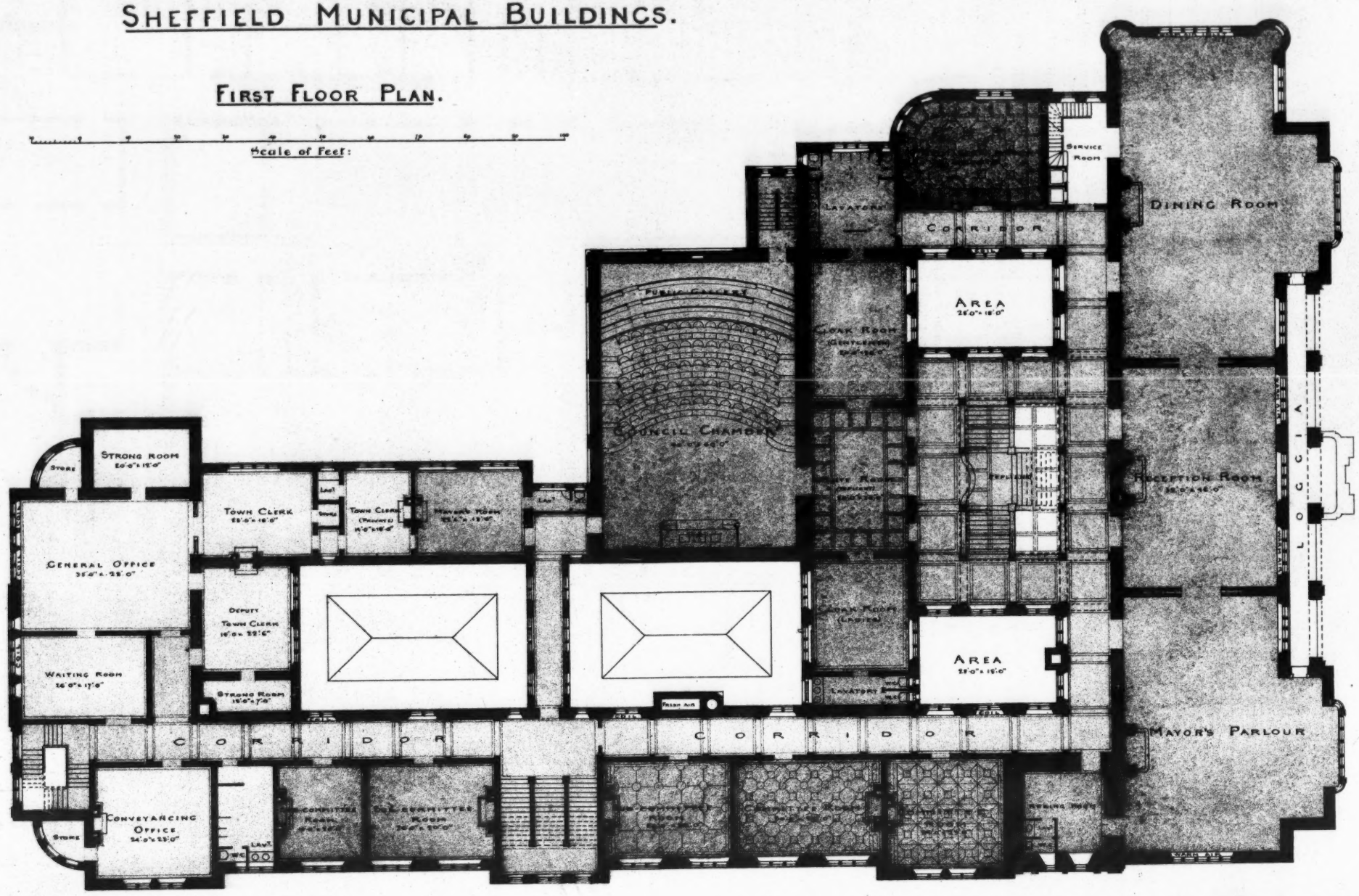
FINAL COMPETITION.

DESIGN FOR

SHEFFIELD MUNICIPAL BUILDINGS.

FIRST FLOOR PLAN.

Scale of Feet:



"INK-PHOTO," SPRAGUE & Co., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

DESIGN SUBMITTED BY MR. H. T. HARE, A.R.I.B.A.

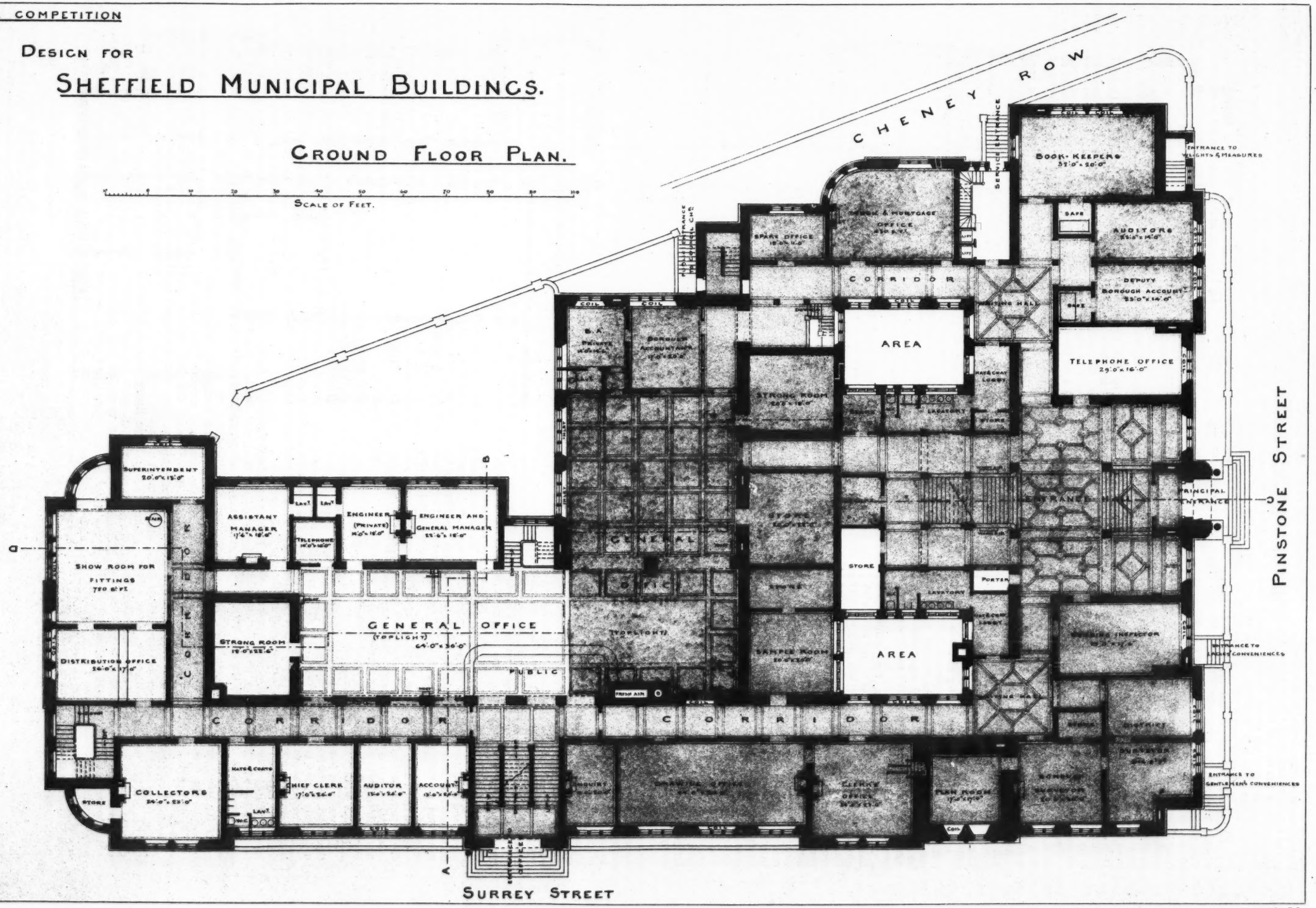
FINAL COMPETITION

DESIGN FOR

SHEFFIELD MUNICIPAL BUILDINGS.

GROUND FLOOR PLAN.

SCALE OF FEET.



"INK-PHOTO," SPRAGUE & CO., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

DESIGN SUBMITTED BY MR. H. T. HARE, A.R.I.B.A.

steel structures would be taken here, to ensure that all material was of quality specified.

The lowest or first story extends from the level of the ground to the floor of the central hall. At the base, the diameter of the circle, passing through the centres of the eight legs, is 300 ft., and at the top 200 ft. The inward slope of the legs is thus 1 horizontal to 4 vertical, or the inclination to the horizon towards the centre is 75 deg. 58 min. The most favourable angle to prevent bending stresses on the legs from partial loading, wind, and temperature is fully discussed under the heading of stresses. The legs are in sectional plan 20 ft. square outside, and consist of four massive corners, braced together as shown. The depth of the bracing is 18 in., leaving an inside clear space of 17 ft., and thus ample provision is made to prevent deformation of the square.

By adopting these large dimensions, it becomes unnecessary to brace the legs together.

The maximum shearing stress these legs produce on the masonry is only 2 or 3 per cent. of the weight, and the friction of the steel and masonry would alone be sufficient to prevent sliding.

As an additional security, the steelwork of each will be bolted to the concrete or masonry with six bolts, 2½ in. in diameter, carried to a depth of 18 ft. These bolts will assist in supporting the legs during construction.

At the base of each leg a ring girder is placed, 5 ft. in depth, resting on a base plate ¾ in. in thickness. The pressure, acting on the corners, will thus be spread over an area of 400 superficial feet of concrete or masonry, giving the moderate direct pressure of about 9 tons per foot.

At the top of the first story, the platform and balcony are supported by a series of ring and radial girders, as shown. These have not only to carry their own weight, the flooring, furniture, and a crowd of people (estimated at a maximum of 1 cwt. per square foot), but also to prevent bending of the legs. For the latter purpose they are made 36 ft. deep at their junction with the legs, and 18 ft. in the centre. Four of the eight legs will be arranged for lifts, and two will have staircases fitted within them. At a height of from 54 to 72 ft. above the base of the second story, a strong ring girder will be erected, 20 ft. wide and 18 ft. in depth, from which the hotel will be suspended by a series of angle-bar ties. This ring girder also forms a support to the roof of the central hall, and gives lateral stiffness to the lower bay of the second story, instead of the ordinary diagonal bracing.

The roof over the central hall is designed to carry the machinery hereinafter described to work the upper lifts, a portion of the lift-case, wind pressure, its own weight, and a covered way from the centre to each of the legs. From this point for a height of 830 ft. a central lift-case is provided, to work three independent lifts, and to support a staircase. The lift-case is 27 ft. 6 in. square, and divided into bays or panels every 17 ft. There are thus nine vertical posts, and the six faces are double braced. Each of the posts and bracings are of such dimensions that they form practically rigid struts, and are capable of bearing wind-pressure, load, and any stress that may be produced by the sudden stoppage of the lifts. The weight of the lift case is transferred at frequent intervals to the legs of the tower, and the supports are so arranged that they both assist in resisting the lateral action of the wind, and prevent the deformation of the regular octagon.

In the third and fourth story, when the diameter of the tower is less, the form of the section of the legs changes, but is always of ample width, and care has been taken to provide ample ring bracing, both horizontal and diagonal, to prevent deformation and resist the action of storms of wind.

The weight of the various platforms together with the hotel, lift-casing, machinery, &c., is supported ultimately by the legs of the octagon.

The tower, above the masonry, as designed, has been estimated to weigh 15,000 tons, which includes an ample margin; it is equally supported by the legs, so that the direct vertical pressure on each at its junction with the masonry is 1,875 tons, the actual pressure in direction of the legs being 1,933 tons.

All the platforms, staircases, public rooms in hotel, &c., are designed to carry 1 cwt. per square foot of area, and the bedrooms in hotel 56 lbs. per sqare foot.

Careful consideration has been given to partial loading; the total live load provided for amounts to 6,000 tons; and, as will be seen further on, the extreme case of 3,000 tons of live load placed on one side of a verical plane passing through the axis of the tower, the other side being unloaded, has been considered and provided for.

The tower consists of open lattice work, and a question arises as to the extent of surface on which to calculate the normal wind-pressure of 56 lbs. If the tower were cylindrical or conical and plated all over, that surface would be one half the area seen in elevation, and this would be nearly true for an octagonal cone.

In an open work structure, the wind passing through strikes the concave side with reduced velocity, and the total pressure may be increased beyond that upon a closed surface. Allowing for this, and observing that the structure is more closely braced at the top, we have taken for the upper 350 ft., 75 per cent. of the area contained between the outer lines of the tower where open, and 50 per cent. where closed in; for the next 300 ft., 65 per cent.; the next 350 ft., 55 per cent. of the open work; and for the lower 200 ft., the area of the surface exposed in each leg in direct elevation multiplied 8 times.

Taking each of these areas so reduced we obtain the following pressures:—

4th or upper stage	250 tons.
3rd	340 ,,
2nd	640 ,,
1st	300 ,,
Total	1,530 tons.

Multiplying each of these by the respective heights of their centres of pressure above the base of the steel-work of the tower, the overturning moment is 738,300 foot tons; and as the weight without any live load is 14,500 tons the centre of pressure is removed $\frac{738,300}{14,500} = 51$ ft., within a base of 300 ft.

It would thus require three times 56 lbs. per square foot of pressure to upset the tower, supposing it were not bolted to the masonry. . . . .

The expansion and contraction of a steel bar 300 ft. long is about 1 in. in this country, at extremes of temperature. In the hottest weather, if the tower were free at the base, the radius of a circle passing through the base of the legs of the tower would expand ½ in. But the legs are fixed at their base by friction and bolts to the masonry. A force is thus set up sufficient to draw each leg inwards to the extent of ½ in.

As the top of the legs is practically fixed also, it is necessary to find what force at half the height of the legs, 82 ft., acting horizontally, would bend the legs ½ in.; this can be calculated, and is ascertained to be 27 tons. A bending moment is produced, increasing the stress on one side of a leg and diminishing the other to the extent of ½ ton per inch, and on the bracing, a tension and compression of ¾ ton per square inch; if the legs were braced together these forces would be largely increased.

From these calculations, it appears that so far as wind-pressure alone is concerned, the slope of the legs should be somewhat greater; but for its own weight and for partial bending and temperature, a steeper slope would reduce the bending stresses.

An inclination, therefore, of 1 in 4 gives about the best slope under a combination of the actions.

The cost of the tower above the foundations the authors estimate as follows:—

1.	Steel-work, 10,573 tons at £27. 10s.	...	£290,757
2.	Hotel, landings, &c. ...	...	26,000
3.	Lifts and appliances ..	...	25,215*
4.	Electric lighting ...	...	8,750
5.	Lightning precautions, &c. ...		1,500
	Total ...	...	£352,222

The price of steel-work includes the supplying, planing, drilling, fitting, and erecting of the whole of the steel-work in the tower, and forms the largest part of the cost.

We are confident the work can be done for the price stated, our views as to the cost of the various items in the above estimate having been confirmed by contractors of large experience in the various departments."

THE VICTORIA HOTEL, MILFORD-ON-SEA, HANTS.

THIS building is now approaching completion, it being intended for a residential Hotel at this new seaside resort of Milford-on-Sea, which should not be confounded with Milford Haven, in Wales, as this place is in Hampshire, four miles west of Lymington, and twelve miles east of Bournemouth.

The walls have, to prevent damp, been built "hollow," of local red bricks, relieved with Bath stone dressings, and the roofs are covered with dark Staffordshire tiles.

The accommodation comprises thirty bedrooms on the first and second floors; and on the ground floor, dining, drawing, coffee and billiard rooms, also private sitting-rooms; and in the basement extensive cellarage.

There are also large livery stables attached and a large refreshment-room for day visitors.

The view from the verandah and balconies of the hotel is very fine, there being a long stretch of gorse as a foreground, and at the distance of four miles looking south the picturesque view of the Needle rocks at the west end of the Isle of Wight; to the east, Hengistbury Head, and to the west Hurst Castle and the Solent.

The architect is Mr. W. Charles Evans, of Milford-on-Sea, and London; and the builders are Messrs. Rashley Bros., Lymington, Hants.

* Messrs. Archibald Smith & Stevens ask us to state that a complete scheme of lifts was prepared by them in accordance with the requirements of the designers, and embodying some novel features.

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of this Council was held on Tuesday afternoon, Lord Rosebery in the chair.

The Chairman said a few words expressing regret at the death of Lord Magheramorne, the Chairman of the late Metropolitan Board of Works, and it was agreed to send to the family of the deceased an expression of condolence.

District Surveyors and their Tenure of Office.—The adjourned report of the Building Act Committee on this subject was now considered. We gave the full text of the report in the *Builder* for June 21, p. 450, so now only repeat the recommendations of the Committee, viz.,

"1. That no person shall be accepted as a candidate for the appointment of District Surveyor unless he shall have attained twenty-eight years of age, and be under fifty years of age, and that every such candidate shall deliver with his application satisfactory evidence of his age.

2. That every candidate shall be required to sign a declaration and deliver it with his application that he becomes a candidate, and will accept the appointment if he should be appointed on the following understanding:—(*a*) That he will personally discharge the duties of his office subject to section 35 of the Metropolitan Building Act, 1855. (*b*) That he will give his whole time to the duties of his office. (*c*) That he will not during his continuance in office (except in the discharge of the duties thereof) carry on business as an architect, surveyor, or builder, or directly or indirectly as a partner or otherwise be interested in such business. (*d*) That he will furnish the Council with information of those cases in his district in which the orders of the Council or the requirements of the Metropolis Local Management Acts with regard to the width of streets, or to any building, structure, or erection, or projection therein beyond the general line of buildings are not complied with. (*e*) That he will make no claim for compensation in case a diminution of his income shall at any time hereafter arise. (*f*) That he will keep his District Office open from Monday to Friday (both inclusive) between the hours of 9.30 a.m. and 5 p.m., and on Saturday from 9.30 a.m. to 2 p.m., and give his personal attendance there daily from 9.30 a.m. to 11 a.m., and (except Saturday) from 4 to 5 p.m. (*g*) That he will retire if desired to do so on attaining the age of sixty-five, or at any date subsequent to his attaining that age.

3. That the aforesaid declaration of the appointed candidate shall on his appointment be entered on the Council's minutes.

4. That the Districts be re-arranged by the Building Act Committee as opportunities may occur, so that the average of the fees received may in no case amount to less than 500*l.* per annum.

The Council reserves to itself the exercise of its powers of dismissal, if the District Surveyor so appointed should not act consistently with the understanding above set forth in any of the matters referred to therein, or for other sufficient reason."

Councillor Hutton, in moving the reception of the report, recapitulated the reasons advanced therein (see *Builder* for June 21, p. 450) for the proposed changes, and in support of these reasons quoted some passages from a paper read by Mr. John Slater at the Royal Institute of British Architects a few months ago. Councillor Hutton spoke strongly in deprecation of the system of "devilling" which was usual in connexion with the office of District Surveyor, and contended that such "devilling" was contrary to the Building Act, which he thought clearly contemplated the personal discharge of the duties of the office.

The motion having been adopted, Councillor Arter moved to add at the end of paragraph 1 words excepting from the limits of age therein stated (1) any candidates who had served more than fifteen years in the office of a District Surveyor, or (2) any District Surveyor who sought to be transferred from one District to another.

This amendment was seconded by Councillor Hughes, but was lost on being put. Clause 1 of the Committee's recommendation was then agreed to, and sub-clause *a* of clause 2.

Councillor R. W. Edis moved the following amendment to sub-clause *c* of the second recommendation, viz.,

"That during the continuance in office he be prohibited from carrying on the business of an architect, surveyor, or builder, or be not concerned, directly or indirectly, as a partner or otherwise, in a business within his own district."

He said he thought this would meet all the requirements of the case, and deprecated the other changes proposed by the Committee. In support of his contention that the changes were undesirable and inexpedient he read the following letters:—

"London County Council, Spring Gardens, S.W
October 22, 1889.

SIR,—The Council has under its consideration the general question of the appointment of District Surveyors, and in particular the question whether they should in future be appointed at a fixed salary of a substantial amount, in order that they may devote the whole of their time to the duties of their office and not engage in private practice. The present mode of payment of the District Surveyor is, as you are aware, by fees, and no restriction exists as to private practice except in their own districts.

The committee to which the subject has been referred would be obliged if you would favour them with the opinion of your Institute upon these questions, and with any other observations on the subject which may occur to them.

I am desired by the Chairman of the Committee further to mention that the following views appeared to be generally approved by the Committee provided any change is made in the appointment of District Surveyors.

1. The elevation of the office of District Surveyor is desired.
2. The examination at present adopted appears satisfactory.
3. The change in the character of the appointment would probably be made only as vacancies occur.
4. The enlargement of the districts would most likely result.—I am, Sir, your obedient servant,

(Signed) H. DE LA HOOKE,
Clerk of the Council.

W. H. White, Esq., Secretary.
Royal Institute of British Architects,
9, *Conduit-street, W.*"

"The Royal Institute of British Architects.
No. 9, Conduit-street,
Hanover-square, London W.
November 13, 1889.

SIR,—We have the honour to inform you that your letter of the 22nd ultimo, on the subject of the appointment of District Surveyors in London, was duly laid before the Council of the Royal Institute of British Architects, and that careful consideration has been given to those points upon which they understand that the London County Council desire from them an expression of opinion.

The conditions under which the District Surveyor is appointed, and the nature of the duties imposed upon him, render it undesirable that he should be paid by a fixed salary, and required to devote his whole time to the work of the office, or be precluded from engaging in private practice, except for buildings within his own district. The interests of the public in this matter are clearly best served by being in charge of a skilled practioner acquainted with the current improvements in building methods and employment of materials, rather than in that of an official who necessarily would have less opportunity of acquiring such knowledge, and who would have no practical experience of the difficulties which arise from time to time—difficulties which are now often solved by the District Surveyor from the results of experience gained in his private practice.

The defects that may now exist would not be ameliorated, nor would the deficiencies of controlling power peculiar to the office, as at present constituted, be removed by any mere variation in the conditions under which the District Surveyor is appointed; and, as you are good enough to state that the Committee of the County Council are desirous of receiving further observations on the subject from the Council of the Royal Institute of British Architects, we are to add that, in their opinion, the powers conferred on the District Surveyor by the Metropolitan Building Act and the by-laws made thereunder are insufficient to secure good building, or such compliance with the essential principles of construction and sanitation as is necessary to eradicate evils long the subject of public condemnation.

The Metropolitan Building Act, 1855, which was primarily intended to avert danger from fire,—to prevent its communication from one building to another,—does not meet the necessities of the present day; nor does it secure, by the limited authority it gives to the district surveyor, the erection of well-built, healthful dwellings. In many most important particulars of construction he is absolutely powerless, while in others his authority is so limited that it can hardly be exercised with advantage.

Should the legislature, by extending the scope of the Metropolitan Building Act and other Acts relating to constructions, as well as of other local building Acts, confer more complete powers upon the District Surveyor in London, and other building officers under local authorities, with a view to the thorough control of buildings, the Royal Institute of British Architects would be willing to develop and extend the statutory examinations it now holds, and thus secure an adequate acquaintance on the part of such officers with those details of professional knowledge which are essential to the satisfactory execution of their important duties.

Great and careful attention has been given for many years to the examination of persons desirous of qualifying for candidature as District Surveyors in London, and our Council are gratified to learn from your letter that, in the opinion of the London County Council, the examination, as at present conducted, appears to them satisfactory.—We remain, Sir, your obedient servants,

(Signed) ASTON WEBB, Hon. Secretary,
WILLIAM H. WHITE, Secretary.
The Clerk, London County Council."

Councillor Marsland seconded the amendment, which after a long discussion was lost, and the other recommendations were agreed to without discussion.

The Strand Improvement Bill.—The Parliamentary Committee presented the following report with reference to the London Streets (Strand Improvement) Bill, 1890:—"This Bill proposed to provide for an important metropolitan improvement in the widening of the Strand between the churches of St. Mary-le-Strand and St. Clement Danes. For that purpose the Bill proposed to carry out the improvement according to the plans and sections shown on the deposited plans, which involved the removal of the houses in the block of buildings between Holywell-street and the Strand and other houses fronting the Strand, and to throw their sites into the public road, making a wide street at this point. The limits of deviation in the deposited plans included the property between Wych-street and the Strand and other property in the neighbourhood, and the Bill gave to the Council the usual powers to take the property within the limits of deviation by compulsion. The limits of deviation were not fixed with reference to recoupment, but were confined to such extent as was absolutely necessary to carry out the works. The Bill has been passed by the Select Committee of the House of Commons (to which it was referred on March 18 last), consisting of nine members, five nominated by the House and four by the Committee of Selection, and the Committee in reporting to the House made, and were invited to make, no alteration in the clauses relating to the execution of the works, according to the deposited plans and limits of deviation. Those clauses leave the Committee in the same state as submitted by the Council, and with the same modifications proposed by the Council with reference to certain particular large premises comprising printing works having access to the Strand, and the access to the Opera Comique Theatre.

In accordance with the resolutions of the Council the Bill contained two important clauses of principle in reference to the cost of carrying the works into execution.

The first related to the principle which the Royal Commission on the Housing of the Working Classes in 1885, defined as follows:—

'That rates should be levied in a higher measure upon the property which derives a distinct and direct advantage from an improvement, instead of upon the community generally, who have only the advantage of the general amelioration in the health of the district. American legislation has adopted the principle that where public improvements are effected by the local authority, they ought to be able to bring in aid of the cost of the improvement any additional value conferred on the adjoining property by reason of the improvement.'

The first principle was recognised in the Chairman's draft report, paragraphs 8 and 9, page xi., but the majority of the Committee expunged these paragraphs, and the betterment provisions have been struck out of the Bill.

Secondly, it was proposed by the 12th section of the Bill to incorporate into this scheme the provisions in Cross's Acts applicable to the purchase of lands for artisans' dwellings, viz.:—

'In settling any question of disputed purchase money or compensation under this Act, the arbitrator, arbitrators, umpire, or jury determining the amount of purchase-money or compensation, shall base the same upon what in their opinion would have been the fair market value of the lands or premises if the improvement had not been contemplated, due regard being had to the nature and condition of the property, and the probable duration of the buildings in their then state, and to the state of repair thereof, and all circumstances affecting such value. But no sum of money shall be awarded for or in respect of any improvement, alteration, or building which in the opinion of the arbitrator, arbitrators, umpire, or jury shall have been made or created with a view to obtaining or increasing compensation under this Act.'

On the second principle the Special Committee have modified the clause as to the method of assessing compensation, and settled it as follows:—

'In settling any question of disputed purchase-money or compensation under this Act, the arbitrator, arbitrators, umpire, or jury, determining the amount of purchase-money or compensation, shall not award any sum of money for, or in respect of, any improvement, alteration, or building which, in the opinion of the arbitrator, arbitrators, umpire, or jury, shall have been made or created with a view to obtaining or increasing compensation under this Act.'

The Select Committee have made a special report, a copy of which and of the proceedings of the Committee will be forwarded to each member of the Council.

We desire to have the instructions of the Council, as to the further prosecution of the Bill, and we recommend,—

'That the Bill, as reported to the House of Commons be proceeded with.'"

Councillor Costelloe moved as an amendment:—

"That it be an instruction to the Committee that the Bill be no further proceeded with this Session."

This was seconded by Councillor Leon, and, after a long discussion, was carried, on a division, by 49 to 39, and the Council shortly afterwards adjourned.

THE "DEVIL" DISINTEGRATOR.—The Hardy Patent Pick Company, of Sheffield, have, we hear, obtained the first prize for disintegrators in the Royal Agricultural Society's special competition. It is claimed for the "Devil" disintegrator, grinder, and mixer, that it will grind to powder, granulate, or shred any material,—animal, vegetable, or mineral,—at one operation. It is capable of grinding cement-clinker, clay, ashes, mortar, paint, glass, broken pottery, &c.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The forty-seventh congress will begin at Oxford on Monday next, July 7. The arrangements for holding the meeting have been sadly interfered with by the lamented death of Lord Carnarvon, the elected President for the year, and efforts were made to postpone the gathering. It was found, however, that it was impossible to do so, owing to the issue of tickets, the entering into of contracts, and so forth. The President of the past year, the Earl of Winchilsea and Nottingham, has kindly promised to act again for the meeting and for the ensuing year, and he will read the inaugural address. The proceedings will be opened at 1.30 on Monday at the Town-hall, where the party will be received by the Mayor and Corporation. Afterwards, many of the University buildings will be visited, including the Bodleian Library, and the Ashmolean Museum. Tuesday will be devoted to a further survey of the antiquities of Oxford; Wednesday to visits to Broughton Castle, Bloxam, &c.; and during the week other objects of interest will be inspected in the city and its locality.

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.—On Saturday afternoon members of the Lancashire and Cheshire Antiquarian Society visited Oldham, and, conducted by Mr. Samuel Andrew, inspected Werneth Old Hall, now the property of Alderman S. R. Platt, and formerly the seat of the lord of the manor of Oldham; Chamber Hall; Cash Gate Cottage, a specimen of the ancient habitation of the "common people"; and Hathershaw Hall, for many generations the home of the Sandifords. Mr. Samuel Andrew read an interesting paper on archæological Oldham.

WORCESTER ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—The first excursion for the season of this society was held on Tuesday in last week, when some of the members and friends took train to Birmingham, and visited Aston Church and Hall, where descriptive papers were read by Mr. Noake, after which the party proceeded to the Colonnade Hotel for luncheon. On the return journey a halt was made at Kingsnorton, where the company inspected the old church, the ancient schoolhouse, and the seventeenth-century parochial library, upon all of which papers were read by Mr. Salt-Brassington, of Moseley.

SUFFOLK INSTITUTE OF ARCHÆOLOGY.—Last week the members of the Suffolk Institute of Archæology and Natural History made an excursion to Dunwich and the neighbourhood between that old town and Saxmundham. Besides Dunwich, they also visited Leiston Abbey, which was described by Mr. W. H. St. John Hope, Theberton Church, and Westleton Church. A long report of the outing appears in the *Suffolk Chronicle* for the 28th of June.

Books.

Encyclopédie de l'Architecture et de la Construction. Directeur, P. PLANAT. Vol. III. 2me fascicule. Paris: Dujardin et Cie.

A GREAT proportion of the last published part of M. Planat's Encyclopædia is occupied by his own article on the very large subject of "Construction," which would make a respectable separate essay in itself. No one who studies the article will regret the length of it; it is probably the most valuable article that has yet appeared in the Encyclopædia. M. Planat commences by a little philosophising on the different conditions of art and construction; art undergoes transformations which are not necessarily progress; construction on the other hand is essentially progressive. The different materials used in construction are then briefly classified, and the special form of resistance to external force which they supply. The article then passes into review, historically, the forms of construction among various peoples, accompanied by a large number of illustrative diagrams. Greek construction and Gothic vaulting are very well and fully treated, considering the limits imposed in an encyclopædia even on a large scale; the writer is not, like most of his contributors, ignorant of English work, but supplies various examples from it. Timber roofs are treated of and illustrated at some length. Among the illustrations to the article are two very useful double sheets of small section of various vaulted and domed build-

ings of the world, drawn to scale for the sake of comparison. Iron construction also has full attention and illustration, in proportion to the other branches of the article, but the author sums up with a strongly expressed disapproval of the modern habit (perhaps more prevalent in France than even in England) of falling back on iron ties and supports to get over difficulties of construction. "Aujourd'hui, la moindre difficulté se présente-elle, on passe un double filet, comme disent les serruriers, on glisse un caisson, un poitrail, une forte poutre. 'Avec le fer cela tient toujours,' dit la sentence moderne; et tout est dit. Cette tendance, chaque jour plus marquée, nous parait regrettable; *avec de pareils procédés, il n'y a plus d'art véritable.*" The italics are ours; the same thing has often been said in this journal, and we are glad to find M. Planat in accord with us. The whole article is an admirable summary of the subject, with some special points of its own (*e.g.*, the remarks on the statics of the flying buttress), and ought to be put in the catalogue of books for students entering for the preliminary examination of the Institute.

"Cloître," "Colonne," and "Commemoratif," are the other most important articles in the volume; the latter deals with commemorative architecture (monuments) and is illustrated by a number of engravings of various typical forms of monument.

The Railways of Scotland, their present position; with a glance at their past and a forecast of their future. By W. M. ACWORTH. London: John Murray. 1890.

MR. ACWORTH'S work on "the Railways of England" has been such a success that it is not surprising that a kind of *encore* to it should be demanded, though it is not very easy to see why the Railways of Scotland should claim a separate treatment as a different problem. The reasons that might be urged are, no doubt, the rather exceptional nature of the ground over which some of them are carried, and the fact that some of them may be regarded rather as holiday lines than railways for ordinary business traffic. However, the book, of much smaller dimensions than its predecessor, is as readable in its way, and contains the same evidence of special acquaintance with the subject. A good deal of the work is occupied with the Forth Bridge and its possible results on northern railway traffic. Mr. Acworth calls attention to the fact that the speed of trains across the Tay Bridge is at present limited to 25 miles an hour, and asks pertinently whether this limitation is to be perpetual, whether a similar limitation will be thought necessary in regard to the Forth Bridge, and if so, whether the gain over the whole journey can be as great as was promised and expected. We have seen no record of the speed at which trains are run over the Forth Bridge, but we should be prepared to find that no reduction of speed would be necessary. The author remarks that in one respect Scotland is in advance of England, two of the leading Companies having begun to experiment on heating their carriages with a less primitive method than the English hot-water tin. One of these is a utilisation of waste heat from the roof-lamps of the carriages, which, by the aid of a small boiler placed over each lamp, and connected with a reservoir beneath the seat of the carriage, sets up a circulating system, the hot water being driven down into the reservoir and the cold rising to supply its place. If the action is really kept up in this way, it is, of course, not on the same system as that of an ordinary hot water circulation, which is actuated by the tendency of heated particles of water to rise above the colder ones. The action of the circulation described must be a purely mechanical one; the hot water boils over and drives the rest before it. But we should rather doubt the efficiency of the system.

Travellers "going North" for the autumn will find a practicali nterest in the book, or should do so. It is a good book for reading on a Scotch railway; instruction and amusement combined.

Practical Perspective: By a DRAUGHTSMAN. Hammersmith: Ferguson & Co.

THIS "book" consists of three large folded sheets of diagrams, written all over with directions for the learner. One sheet contains a number of small problems; another the lines and setting out for a perspective of a rather elaborately-gabled house, and the third shows the same house developed into an artistic drawing. It is well done, and as a practical exemplification of the subject it should be of use to beginners. A case should be supplied for the sheets.

Knight's New Perspective Guide. By J. P. KNIGHT. London: Simpkin, Marshall, & Co.; Bristol: John Wright & Co.

A SMALL shilling book containing practical diagrams of various problems in perspective, for beginners only. Directions are given on the facing page of each plate. These are very clearly worded; but there are one or two mistakes in principle: about 35 degress, not 60, is the average angle that can be advantageously included in a perspective drawing; and to use French curves to draw in the various portions of a circle in perspective is very bad advice. French curves, for this kind of purpose at all events, are a delusion and a snare; the curves in them will never entirely fit the case; no good draughtsman would use them for the purpose, and no one will ever become a good draughtsman by using them. The eye and hand can alone supply the delicate gradations required in perspective curves, and must be trained to do so.

Correspondence.

To the Editor of THE BUILDER.

THE ARCHITECTURAL ASSOCIATION.

SIR,—I am rather surprised at the articles which have appeared in the *Builder* relative to the suggested alteration in the constitution of the Architectural Association in which certain members are characterised as "the opposition." I think it only fair to those gentlemen who hold the same views as myself to say that, whatever may be our individual opinions as to the scheme suggested by the Education Committee, we are very desirous that no serious alteration shall take place in the objects and working of the Association, without the opportunity being afforded to all members to express their opinion thereon.

After so many years of membership and work in connexion with the Association, during which there has been a gradual increase in the number of members and attendance at the classes, lectures, &c., I claim at least as much interest in its welfare as those who are comparatively young in its service, and naturally I am jealous lest an untried, and I believe not a popular scheme, should upset or even check its admitted usefulness and success.

If a majority of the members, or I would even say of those under twenty-five years of age (who may be assumed to take the most lively interest in the Association at the present time), should express themselves in favour of the proposed alteration, I would readily accept the decision.

It has always been the pride of the Association that by its constitution it could adapt itself to the requirements of the day, and I can see no reason why the desires of the Education Committee cannot be carried out without any alteration of the rules as is the case with the courses of lectures and classes which have been formed from time to time.

I trust that, although there may be differences of opinion amongst the members, each may give credit to the other for the best motives to promote the welfare of the Association, and earnestly hope that it may continue free from cliques and parties which it has been the work of years to prevent, as "a house divided against itself cannot stand."

July 2, 1890. J. DOUGLASS MATHEWS.

SIR,—In your editorial note last week, referring to the recent proceedings at the Association, you speak of certain members "who have carried on so determined an opposition to the scheme of the Committee." As a matter of fact, there has been very little opposition at all, and I am afraid that the apparently anything but impartial source from which your reports have been derived, in the absence of your own reporter, has somewhat involved you.

A number of members for some time past have been of opinion that votes on important changes in rules should be taken by means of papers sent to every member. The changes now proposed are very radical and it is highly desirable that they should not be passed by the votes of a mere handful of members at a meeting held in the vacation. Accordingly a proposal was made at the adjourned ordinary meeting on June 13, in a perfectly constitutional manner and after notice had been given to the President, to alter the rule relating to voting, and it was distinctly stated by the mover of the alteration that it was not intended in any way to express any opinion for or against the new scheme. If the proposal had been accepted by the Committee the papers might have been issued at once for voting on their scheme; but so much opposition was shown, so much odium thrown on those who had signed the requisition in favour of voting by papers (who were told that if their resolution were carried it would result in rescinding everything that had been done, an argument that did not say much for the popularity of the scheme), and so little inclination to reasonably discuss the proposal and come to a speedy decision that the only thing that could be done was to adjourn everything to next session. It is clearly the Committee who are answerable for the delay, not those who want to vote by papers.

W. J. H. LEVERTON.

*** We believe the account of the proceedings at the last meeting was correct as to facts. Our opinion as to the mistaken nature of the opposition to a very spirited scheme of progress was formed long before the holding of the last two meetings. Our own reporter was absent from these because it is not usual to report purely domestic matters such as the revision of rules or by-laws of societies. We had previously reported at very considerable length two meetings of the Association at which the points at issue were fully discussed.

PUBLIC SURVEYORSHIPS.

SIR,—I have noticed lately a prevalent and growing disposition on the part of local authorities, when advertising for a surveyor, to make a *compulsory* condition that candidates should submit a large number of printed testimonials with their application.

I emphatically protest against this practice, which is most unreasonable, and should be discouraged by all possible means, as it is a serious source of expense to competitors, and debars many from entering the lists.

Only in your last issue a public appointment was advertised, the printed matter for which will cost each competitor, say, at the least a guinea, thus showing the entirely unnecessary and heavy expense to which applicants are put, as, of course, only one candidate can be successful.

If printed testimonials are required for the convenience of individual members of authorities, I think the expense should be borne by them, and not by the candidates. SURVEYOR.

*** We have received another letter on the same subject and in the same strain. We fear our correspondent's proposal would only lead to multiplying the number of inefficient candidates in such cases.

WOODEN "WATER-PIPES."

SIR,—Having noticed what has lately appeared in the *Builder* respecting the above, I am reminded of the same kind of contrivance which was quite common in my native place (a large village in Herts) sixty years ago; and I should not be surprised if some are still in existence. The principal water-supply was obtained from wells, of which there were a large number, by means of pumps; and with very few exceptions the pipes for these pumps were composed of "elm-trees," with a bore, as near as I can remember, of about 3 in. or 3½ in., and jointed together exactly as shown in the diagram, page 455 of the *Builder* for June 21; the sides of the trees were roughly hewn square, the upper section shaped to form the framework of the pump.

I have occasionally, when a boy, seen the operation of boring a tree going on in the builder's yard, —presumably to replace one that had become decayed. The tool for boring was of the same form and make as an ordinary carpenter's auger, enlarged to the size and length required, and took two or three men to work it, the tree being elevated horizontally upon trestles, and a framework of corresponding height to support the tool, which worked in wood bearings, in a similar manner to machine shafting, to keep it in position.

J. WOODLEY.

DISCOVERIES AT SELBY ABBEY—The *Leeds Mercury* of June 27 reports that within the past few days two most interesting discoveries have been made in connexion with the restoration of the south wall. The first was the discovery of a part of an old gravestone bearing the date of 1716. "This clearly shows," says the *Mercury*, "that part of the church which was destroyed by the fall of the tower in 1690 was rebuilt towards the end of the last century, and not in 1702, as was generally supposed. The tombstone bears the name "Merebeck." The later discovery, however, is still more interesting. Certain foundations have been discovered, indicating the existence on the east side of the south transept of a Norman apsided chapel extending eastward from the old Norman south transept. The work on this part of the restoration has been suspended for a few days, until Mr. Scott, the architect, is able to inspect the foundations. There are indications of the Norman, the Decorated, the Perpendicular, and modern work in the foundations of the south wall, the present restoration being evidently the fifth that has taken place in that particular portion of the ancient edifice."

The Student's Column.

HOT-WATER SUPPLY FOR BATHS, LAVATORIES, AND OTHER DOMESTIC AND GENERAL PURPOSES.—I.

PREFATORY.

A SUPPLY of hot water throughout a house is no longer considered a luxury, but merely a common comfort, a necessary, and expected as a matter of course by the majority of tenants of property at as low a rental as 30*l.*

This subject, however, is, of the various trades called into request in house construction, perhaps one of the most difficult for professional men to obtain reliable information upon, owing to several causes; the chief difficulty being that, as little information has been written or published on this work, knowledge can only be gained by actual experience.

The number of failures that occur in this work is greatly in excess of those in most other trades, by reason of its success or non-success (except in simple every-day jobs) being greatly dependent upon an acquaintance with natural laws, and it is unfortunately obvious that the majority of our mechanics have little knowledge in this direction.

CIRCULATION.

It is but a comparatively short time ago that an attempt to utilise hot water for heating purposes was made by connecting a pipe or series of *single* pipes with a boiler, the hot water (from the boiler) being allowed to run into the pipes, and this was found to be a success in a limited way, as the water did not appear to grow cold as might have been anticipated.

The good results obtained were due to the fact that water will circulate in a single pipe, as any one sufficiently interested can quickly determine by experiment, and it will be found that if the pipe be carried in a vertical direction from the boiler there will (supposing heat to be applied) at once set in two distinct movements in the water, that in the centre ascending, and that nearest the surface descending; or if the pipe be carried in a slanting direction the water nearest the top of the pipe will be found travelling from the boiler, and that at the bottom of the pipe towards the boiler.

Possibly when this attempt was first made it was expected that the heat generated in the boiler would be transferred to and along the water in the pipes by conduction, as would be rightly anticipated if heat were applied to one end of a rod of metal; but as water is an extremely poor conductor of heat the result obtained in the transference of heat from the boiler throughout the length of pipe or pipes was soon ascertained to be from another cause, viz., convection, and it is with this property that water possesses that we have to deal, as without it a hot-water circulating apparatus could not exist.

The single pipe system was but short-lived, it being almost immediately ascertained that by providing two pipes and connecting them at the extremity a more rapid and efficient circulation resulted, as it did not necessitate a flow of water in two directions within one pipe, and it is from this early arrangement of two pipes that all our systems of hot-water circulation for heating and for domestic supply purposes have been developed.

Water is composed of two gases which exist in chemical combination (H^2O) forming molecules, and water, therefore, consists of a vast number of extremely minute particles, we might say like a heap of sand, but differing from this substance by the fact that the particles have the property of gliding over, under, or around one another (when agitated) practically without the least friction or resistance. Of course water differs from sand also in the fact that we could not have a heap of it, as water, unless confined, instantly distributes itself in all directions; but the comparison is used to make it understood that water is composed of particles or grains (molecules).

When a boiler or vessel is filled with cold water and left undisturbed the particles may be considered to be quite stationary, but immediately heat is applied below the particles nearest the heated surface become warm, and they, like all other substances, are expanded by the heat, and as an expanded particle does not gain in weight as well as size it naturally is made lighter, bulk for bulk, than its fellows.

Immediately, therefore, the particles nearest the heated surface become expanded they are caused to rise by the superior weight of the cold particles surrounding them, and the cold particles that then come in contact with the heated surface become warmed and expanded

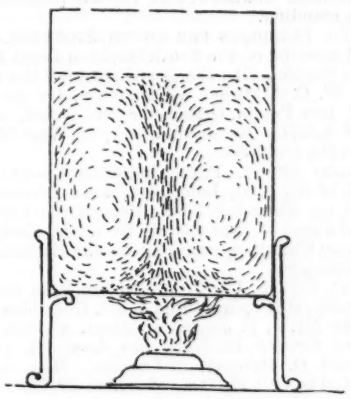


FIG 1

and rise also, and so the action continues; so long as heat is applied a continuous stream of heated particles rising and a continuous stream of colder particles replacing them, and this is the process of convection.

When the fire is applied to a boiler having a system of circulating pipes in connection with it, the heated particles rise to the top of the boiler, and finding an opening (pipe) there, con-

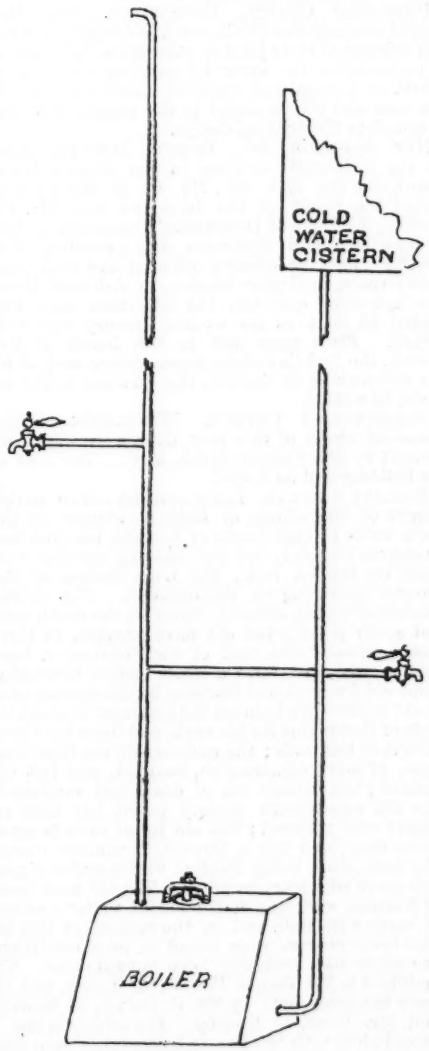


FIG 2

tinue rising up within it until they reach the highest point in the circulating apparatus, above which they cannot rise, and it can be readily understood that for every particle that travels up the flow pipe there must be a corresponding particle come down the return pipe to replace it; the action is the same as in the boiler alone; a stream of heated and lightened particles rising until it is impossible for them to rise further, and a corresponding stream of colder particles travelling downwards to replace the heated ones, until they come within the heated area, when they are expanded, and at once reverse their direction, and follow their predecessors. This circulation proceeds at a much higher speed than is commonly imagined; when first started the heated particles travel about 12 in. per second, and afterwards, when the water is well heated, at about double this rate.

The earliest description of pipe apparatus to supply hot water for draw-off purposes above the level of the boiler was merely a large boiler in the kitchen range, a pipe from the house cistern down to the boiler, and a pipe from the boiler to above the level of the house cistern (Fig. 2): from this latter pipe the draw-off services were taken, and it will be readily understood that (water always finding its own level) a draw-off service could be connected and hot water obtained at any point below the house cistern.

There were several insurmountable objections to this arrangement; in the first place, a very large boiler was necessary, as no tank could be used, and the largest boiler in an old open range could hardly exceed sixteen gallons capacity, a very insufficient quantity for a store of hot water, as can be judged by the fact that a tank of such small capacity is now never used for even the smallest of hot-water supply purposes. A second objection was that with a long single service-pipe a great quantity of cold water had to be drawn off before hot was obtained, and there were several other objections; but, no doubt, amongst the chief reasons for the discontinuance of this system was the fact that these large boilers were very costly, and as, with the best provision, they were very difficult to clean out, they frequently became fractured, creating no small annoyance and expense, and as soon as it was understood that a smaller boiler and smaller fire (with the addition of a tank) would provide a much more reliable and abundant supply of hot water, the old system naturally fell into disuse.

SURVEYORSHIPS.

CHELMSFORD.—At a meeting of the Chelmsford Town Council, on June 25, the Special Purposes Committee recommended that the resignation of Mr. C. Pertwee, the Borough Surveyor, already mentioned in the *Builder*, be accepted, the resignation to take effect on the day on which the new Surveyor enters upon his duties. According to the *Essex County Chronicle*, they also unanimously recommended the Council to appoint a Surveyor who should devote his whole time to the duties of his office and not be engaged in private practice, and that his salary be fixed at 230*l.* per annum in addition to the salary paid to him by the Joint Sewerage Committee. They also recommended that an office be provided for him. They thought it was highly desirable that the newly-appointed Surveyor should be also the chief sanitary officer of the borough, and that the inspector of nuisances report to him at once all matters requiring attention in respect of which no order from the Council is necessary to authorise immediate action.—In reply to Mr. Maskell, the Mayor said that the salary of the Surveyor for the Joint Sewerage Committee was 20*l.* The report was adopted.

KENT.—On the 27th ult. a number of the friends of Mr. A. F. Ginn, late Surveyor of Highways and Sanitary Inspector to the Chelmsford Rural Sanitary Authority, met at Chelmsford, to present him with a handsome gold watch, on his leaving the district for an appointment as District Surveyor to the Kent County Council.

OBITUARY.

THE EARL OF CARNARVON died on Saturday last. He was for seven years (till 1885) President of the Society of Antiquaries, and a member of the Historical MSS. Commission in 1882. He had intended to preside over the meeting of the British Archæological Association at Oxford next week.

LORD MAGHERAMORNE, who will be better remembered as Sir James McGarel-Hogg, Chairman for many years of the late Metropolitan Board of Works, died on Sunday last.

SIR JAMES GOWANS.—Sir James Gowans, Dean of Guild of Edinburgh, died last week, at the age of 69 years. Sir James Gowans was a son of the late Walter Gowans, of Gowan Bank, Linlithgowshire, and received his education principally at Hamilton-place Academy, Edinburgh. Sir James was educated for the profession of an architect, but his attention was diverted from that course by the great opening for energy consequent upon the call for workers in the construction of railways. In the capacity of a railway engineer and contractor he was engaged in carrying out some of the most extensive and important railways in Scotland, the most difficult of which to deal with was the 35 miles of the Highland Railway through

mountainous localities. Edinburgh has never had a more able and energetic Dean of Guild than Sir James Gowans. He displayed great firmness in resisting the influences which are brought to bear upon the holder of that office by interested parties, and as Chairman of the Health Committee of the Town Council he was instrumental in carrying out several sanitary improvements in the city. He was knighted in 1886 in connexion with his work in promoting the Edinburgh Exhibition of that year.

SIR WARINGTON W. SMYTH, F.R.S.—Speaking of the death of Sir Warington Smyth, F.R.S., the *Mining Journal* says:—Cornwall has lost another thoroughly familiar face by the death of Sir Warington W. Smyth, so long the chief officer of the Crown Mines in the kingdom. He was one of the last survivors among the younger group of the great band of pioneer geologists and mineralogists who made the name of England famous, combining practice with science in the highest degree.

MR. J. L. RANDAL, Architect to the Shrewsbury School Board, died last week, after a long illness.

MR. W. H. STUBBS, C.E.—The death is announced at Blackpool of Mr. W. H. Stubbs, M.Inst.C.E., formerly Engineer of the North Staffordshire Railway, but recently Chief Engineer of the Manchester, Sheffield, and Lincolnshire Railway Company.

GENERAL BUILDING NEWS.

THE CHURCH HOUSE, WESTMINSTER.—At the annual general meeting of the Corporation of the Church House, held last week, a resolution affirming the desirability of immediately commencing the permanent building for the Church House was adopted. The Bishop of London, in seconding the motion, said that the Corporation had already 9,200*l.* which they could devote to building purposes. They proposed to build the great hall for meetings, and rooms for the Houses of Convocation and the House of Laymen, besides other offices, and therefore they were making a real beginning of the actual working part of the Church House. They needed altogether 35,000*l.*

MIDLAND RAILWAY GOODS DEPÔTS, BIRMINGHAM.—The new goods depôt which is slowly transforming the Suffolk and Severn Street-square from the most disreputable district of Birmingham into the busiest and most commercial is (according to the *Birmingham Gazette*) only one of several signs that the Midland Railway Company have determined to reorganise and develope their midland counties traffic. Something like 150,000*l.* is to be spent in improving the Lawley-street depôt; a loop line will almost immediately be constructed between the main, running through King's Heath, and the Suburban, running to King's Norton; and the engineers of the Company are now devising plans for bringing the canal at Worcester Wharf into direct touch with the railway service by means of a huge hydraulic lift, which will be able to carry loaded trucks from the line level to the canal bank, and so render transfer from boat to truck and truck to boat a matter of minutes rather than hours. The basement of the Suffolk-street depôt has been nearly completed by the contractor, Mr. Firbank, who will soon, it is said, put a large number of masons to work on the superstructure.

BOROUGH-ROAD POLYTECHNIC INSTITUTE.—The executive of the South London Polytechnic Institutes have obtained possession of the buildings in the Borough-road formerly occupied by the British and Foreign School Society, which will be altered and transformed into the Borough-road Polytechnic Institute. Mr. Rowland Plumbe, the architect appointed to carry out the work at the latter Institute, is now preparing the necessary working drawings.

CHAPTER-HOUSE, ST. MARY'S CATHEDRAL, EDINBURGH.—A provision was made by the late Mr. Hugh J. Rollo, Writer to the Signet, in his settlement for the completion of the Chapter-House of St. Mary's Cathedral, Edinburgh, and Mr. J. Oldrid Scott has been preparing plans for it. The building is to be square on plan, but with an octagonal upper stage, and will have a groined vaulting springing from a central pier of polished granite. The cost of the work will be about 5,000*l.* Messrs. Morgan & Sons, of Glasgow, are the builders.

CAMDEN PARK ESTATE, CHISLEHURST.—We are informed that Camden-place and Park, Chislehurst, the late residence of the Empress Eugénie, has been purchased by W. Willett, builder, of London and Brighton, who proposes to develope it as a building estate.

PROPOSED NEW POST OFFICE FOR LIVERPOOL.—On Thursday in last week a deputation, comprising the Mayor of Liverpool, several local members of Parliament, and members of the City Council, waited upon the Postmaster-General to lay before him the inadequacy of the present accommodation at the Liverpool General Post Office, and to urge that steps should be taken to acquire a site in Victoria-street. Mr. Raikes, the Postmaster-General, said a site had been offered in Lime-street, but he promised to consider the views of the deputation.

THE CHAPTER-HOUSE, DURHAM CATHEDRAL.—Dr. Lake, Dean of Durham, appeals for funds for the complete restoration of the Chapter-house of the Cathedral of Durham, as a memorial to the late Bishop Lightfoot.

THE PRIORY CHURCH, LEOMINSTER.—The western tower of the grand Priory Church at Leominster, which has been in a dangerous condition for some considerable time, is to be repaired at once. The architects, Messrs. Kempson & Fowler, of Llandaff, have in their work a most important and responsible commission, for the construction, as described in their elaborate report to the Committee, is of a most unusual character, and the dilapidations are of long standing.

PUBLIC BUILDINGS FOR SOUTH STOCKTON.—At a special meeting of the South Stockton Local Board, held on the 25th ult., the Board accepted the tender of Mr. W. C. Atkinson, of Stockton, for the erection of new Public Offices for the Board, at the sum of 3,327*l.* Mr. J. M. Garry, of West Hartlepool, is the architect.

CHURCH OF ST. PAUL, LONGRIDGE.—The new Church of St. Paul, Longridge, near Preston, was opened on Thursday last. The church has been built at a cost of over 8,000*l.* from the designs of Mr. Ewan Christian, architect to the Ecclesiastical Commissioners.

ROYAL HOTEL, CARDIFF.—It has been resolved to considerably enlarge this hotel, from plans prepared by Mr. J. P. Jones, architect, Cardiff. The contract for the ironwork has been let to Mr. Archibald D. Dawnay, of London. The work is estimated to cost 25,000*l.*, of which 19,470*l.* is the amount of the builder's contract, the builders being Messrs. C. Sheppard & Son, of Cardiff. The carving will be executed by Mr. Wormleighton, of Cardiff. The adamant mosaic floors will be supplied by Messrs. J. & H. Patteson, of Oxford and Manchester.

BOARD SCHOOLS, BARKING.—At a recent meeting of the Barking School Board the General Managment Committee reported that Mr. C. J. Dawsoe had presented preliminary designs for the new schools. The committee recommended that schools be erected to provide for an additional 350 children, making in all 1,350. The report was adopted, and the architect was requested to prepare the necessary plans for the Education Department.

UNITARIAN CHAPEL, DUKINFIELD.—The Old Chapel congregation (Unitarian), Dukinfield, having just celebrated their jubilee year, have determined to memorialise the event by spending the sum of 2,000*l.* on internal and external improvements. A new west end will be added to the chapel in order to complete the original design.

NEW SPA-ROOM, &C., BUXTON, DERBYSHIRE.—At the fortnightly meeting of the Buxton Local Board, on the 27th ult., Mr. G. F. Barnard reported the result of the interview with Mr. G. Drewry, the Duke of Devonshire's agent, as to the erection of a new Spa-room, the providing of a cemetery, and the opening-out of a new road from Dale-terrace, in Higher Buxton, to Ashwood Dale. The Spa-room question, the Chairman said, was settled at once as far as Mr. Drewry was concerned. Plans were now in the hands of Mr. Currey, the Duke's architectural adviser, and, if he was satisfied as to the site, the question would no doubt be settled.

PRESBYTERIAN CHURCH, WIMBLEDON.—The memorial stone of this new church was laid on June 21 by Mr. Samuel Smith, M.P. The cost of the building will be 5,000*l.*

BEELSBY CHURCH, LINCOLNSHIRE.—The parish church of the village of Beelsby, situate on the north wolds of the County of Lincoln, has just had its church restored, and the opening services took place on the 1st inst., the Lord Bishop of the Diocese preaching on the occasion. The church consists of a nave chancel, vestry on the south side, and south porch; the old nave arcades, of three arches on each side, and of early character, have been rebuilt, and form a good feature internally. Some old fragments of fourteenth century character found in the walls induced the architect to adopt the style of that period for his work, and these have been rebuilt in the walls; the roofs are of the interlaced type, of solid construction, boarded, and left unstained; the fittings are of deal, and varnished; the old seventeenth century pulpit has been retained and restored; the old tower arch is again doing duty, and has a three-light window over it, the west gable being finished with a well-designed bell gable with spire terminal. The old west tower of Norman work was found buried under a mound of earth 6 ft. high, and on the removal of this the two lower courses were found in good condition; the tower had evidently been burned down. The architect is Mr. James Fowler, of Louth, and the work has been done by Mr. C. Baines, of Newark, and Mr. West, of Beelsby. The east window, of three lights, with fine flowing tracery, has been filled with stained glass representing the Ascension.

SOCIETY OF ARTS.—The annual *conversazione* of the Society of Arts was held on the 27th ult. at the Natural History Museum, South Kensington. There was a very large attendance, the number of guests being estimated at between three and four thousand. They were received in the Great Hall by the Duke and Duchess of Abercorn, the Duke being the Chairman of the Council of the Society. While mentioning the Society of Arts, we may note that on Monday last, at Windsor, the Queen conferred the honour of knighthood upon the Secretary, Mr. (now Sir) H. Trueman Wood.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY IN SOUTH-WEST DURHAM.—On June 25, at the Barnard Castle Police-court, three men were prosecuted for trespass on the Lynesack Farm, in the South-West Durham colliery district. The defence was that the defendants were absolutely compelled to trespass in search of water, as a positive famine existed. A fine was inflicted in each case.—Susequently at a meeting of the Teesdale Rural Sanitary Board, Mr. Shipley, the manager of the Woodland Colliery Company, said that the colliers were drinking water from hedge-drains and ditches, and the workmen would not live in the district owing to the dearth of water. Mr. W. T. Scarth said the colliery companies had tapped the whole of the springs in their workings, and the question was, who should be called upon for restitution. Mr. Robinson, C.E., produced plans for the extensive Cockfield district water supply, which were approved. The estimated cost was 3,492*l.*; and it was resolved to apply for the sanction of the Local Government Board to borrow 4,000*l.* to carry out the scheme.

DEFECTS IN DRAINAGE OF SUNDERLAND HOUSES. At the last meeting of the Health Committee of the Sunderland Town Council, Mr. Frank Caws, architect, attended with reference to the leakage from soil-pipes into the foundations of houses instead of into the sewer. He stated that he had discovered the defect in two or three houses, and he was afraid that it existed in a great many. Diagrams were produced, and Mr. Caws explained a plan of his designed to overcome the difficulty. (See *Builder* for June 14, p. 437). The Chairman, in conveying the thanks of the Committee to Mr. Caws, expressed a hope that the members of the Building Committee who were also members of the Health Committee would endeavour to carry out the ideas suggested by Mr. Caws.

STAINED GLASS AND DECORATION.

ST. SERIOL'S CHURCH, PENMAENMAWR.—A two-light memorial-window has just been erected in St. Seriol's Church, Penmaenmawr. The subject represented is the Nativity. The work has been designed and executed by Messrs. Mayer & Co.

CLIFTON COLLEGE CHAPEL has recently been enriched with mosaics. The mosaic pavement in the apse is decorative, and contains one figure only, that of the sower going forth to sow his seed. This mosaic is of marble, and was made and laid down by Italian workmen. The mosaic picture above the communion-table is from a painting by Mr. W. Holman Hunt, which he made in 1886-7, to be reproduced in this manner for the College Chapel. The work has been produced in England by English workmen in the employ of Messrs. Powell, of Whitefriars. The mosaic picture and reredos are the gift of the Head-Master

THE DEAN BURGON MEMORIAL WINDOW, OXFORD.—The subject of this window, which it is proposed to erect in St. Mary-the-Virgin Church, and which has been designed by Mr. C. E. Kempe, M.A., is, according to the *Oxford Journal*, a "Jesse Tree." At the base of the window, which is a good deal obscured by the west gallery, are shown the heraldry of the twenty-one existing colleges, supported by angels; above this in the centre Jesse reclines, with two of the Judah kings on each side, and the four Evangelists writing their Gospels. The design came before the Hebdomadal Council on Monday week, and was approved.

FOREIGN AND COLONIAL.

STUTTGART.—It has been decided to erect a group of buildings, comprising an infirmary, poor-house, and workhouse, on an extensive site outside the northern suburb of the town. In the infirmary, room for some 350 inmates will be found; the poor-house will have accommodation for 100 families and 150 single persons; and the workhouse will have, besides its ordinary wards for 130 inmates, a night ward with 110 beds. A competition, open to German architects only, has been arranged by the Corporation, and the programme shows that three premiums, of a total value of some 500*l.*, will be given away.

BERLIN.—Some time ago the report circulated in the local papers that the Emperor had expressed his intention of seeing the old St. Mary's Church (situated at no great distance from his palace) surmounted by a dignified tower. We now hear that the Architekten-Verein has of its own accord opened a competition to its members for designs for such a spire. The spire is to be of brick, and about 250 ft. in height.——The annual election at the German "Academy" (Academy der Kuenste, Berlin) shows that Professor Karl Becker, who has held the post of president since 1880, will remain in office, and that the eminent architect, Professor Ende, will be the vice-president of the year. Karl Becker will attain his seventieth year next December, and the forty fourth consecutive one of his residence in the capital. Professor Ende (hon. cor. member to the R.I.B.A.) has been able to again take up his usual lecture at the Royal Technical College this term, after having taken a year's leave of absence on account of ill-health.

STOCKHOLM.—We hear that the building belonging to the Architectural and Technical College have been destroyed by fire, and that the valuable collections of models, copies, &c. (some 10,000 numbers), have been lost. The building showed the date 1863, and had been erected by Professor Scholander.

REMARKABLE SWEDISH COMPENSATION CASE.—A very remarkable compensation case is now before the Swedish Parliament. The builder of the new Upsala University, Herr Hallström, found that his speculation, through various causes, resulted in a loss to him of about 33,500*l.*, and this sum, or if not the whole, part of it, he has petitioned the Crown to make good, and the latter has met the prayer of the unfortunate *entrepreneur* so far as to actually propose to the Parliament that he be paid 2,800*l.* in cash, and a life pension of 170*l.* Naturally, this extraordinary piece of benevolence has attracted much notice, particularly as it is open to doubt whether the *entrepreneur* would have returned any money had he made an excessive profit out of his speculation.

INFORMATION FOR EMIGRANTS TO THE COLONIES.—The July circulars, the annual penny handbooks, one on each Colony with maps, and the Emigration Statutes and Professional Handbooks price 3d. each (the whole being also bound together price 2s.), issued by the Emigrants' Information Office, 31, Broadway, Westminster, S.W., show the present prospects of emigration to the Colonies. Male and female emigrants for Queensland, Western Australia, the Cape and Natal, may in certain cases obtain through friends or employers of labour in those Colonies, passages at reduced rates. Queensland also offers free and assisted passages to unmarried female servants, sempstresses, miners, navvies, and farm labourers (but for male labour there is just now no demand in the Colony). Miners are wanted in Tasmania and New Zealand. There is no special demand for mechanics, except in some few localities, as for carpenters and bricklayers in Natal. The demand for mechanics in Cape Colony, to which attention was drawn last April, has since slackened, owing to the depression at the Transvaal Gold-fields and consequent return of large numbers of workmen to Cape Colony and Natal. Emigration to the Transvaal under present circumstances is not advised. It should be noted that it is too late in the year for men to go to Canada, unless they go to friends or have enough money to keep them through the winter.

MISCELLANEOUS.

NEW PARKS FOR SOUTH SHIELDS.—On June 25, South Shields was *en fête* on the occasion of the opening of the Marine Parks and the unveiling of the Queen's Jubilee and Lifeboat Memorial. The parks have been laid out from designs by Mr. M. Hall, C.E., Borough Surveyor. The two parks have cost £22,000.

ARCHÆOLOGICAL EXPLORATIONS AT KENILWORTH. The work of opening up the long-buried remains of the old Priory Church and the adjoining monastic buildings at Kenilworth has begun. According to the *Birmingham Gazette*, the place for the start was chosen by Mr. T. W. Whitley, of Coventry. About sixteen yards west of the spot where the preliminary boring showed the situation of the western entrance-door, the ground rises abruptly, and is at a higher level than any other point in the churchyard. Here operations were begun. The entrance to the monastery was soon found, the door opening being of massive proportions and about 9 ft. wide. The line of walling was then traced out, and the excavators found themselves within the walls of a spacious room about 16 ft. in width. This, it is said, originally formed the main entrance to the monastery and cloisters. The removal of the interior brought to the surface a considerable quantity of finely-worked stone, the supporters of the groined arched roof, and a couple of central keystones with splendidly-carved bosses, as cleanly cut and as crisp in outline as when first made. Two massive corbels, with circular worked caps and fluted brackets, have also been bared. Further on a door was found leading into an outer court, and in close proximity to the church door (west).

THE MIDDLETON TOWERS ESTATE.—This estate, which was sold at auction a few weeks since for 23,000*l.*, is again placed in the market. We adverted to this property in a "Note" on August 17 last. The fifteenth century gateway of Lord Scales's Castle and a good oriel window were preserved at the rebuilding of thirty years ago.

NO. 18, ST. JOHN'S WOOD-ROAD.—In the course of this month will be put up for sale, at the Mart, this house, which for several years was occupied by Sir Edwin Landseer, and in which he died. The house was arranged internally by Sir Edwin to meet his own requirements as a painter.

ETON.—The July number of the *English Illustrated Magazine* contains a double article on Eton, by Mr. Maxwell Lyte and the Hon. A. Lyttelton, with a number of sketches of various parts of the school buildings by Mr. Alfred Norman.

THE DUBLIN CARPENTERS' STRIKE has terminated. The 54 hours' week is to be commenced on Oct. 1, at 34s. per week. The 57 hours' week will continue in the *interim*.

DRAWINGS OF ANCIENT NORTHERN ARCHITECTURE.—An interesting work is making its appearance in Copenhagen, entitled "Drawings of Ancient Northern Architecture," by O. V. Koch, V. J. Mörk-Hansen and Erik Schjödte. The second collection, third series, has just been issued, comprising eighteen plates. The principal are those of the Vadstena castle, in Sweden, the style being a rich Renaissance, and an altar-table from Linköping Cathedral, originally Roman, but with pure Gothic additions. From Norway we have a "Stabur," drawn by A. Mathiesen, one of the curious outhouses in old Norse style, characteristic of that country, since erected by King Oscar in a park at Christiania, whilst plate ten reproduces the southern portal of Velling church, near Ringköbing, in Denmark, richly ornamented with the fantastic tracings of animals that characterised ancient Scandinavian architecture. The work is supported by a state subsidy.

EAST OF SCOTLAND ENGINEERING ASSOCIATION.—The third excursion for the session of this Association took place on Saturday afternoon, when, by permission of the Edinburgh and District Water Trustees, the compensation reservoirs at Threipmuir and Harelaw were visited.

THE PAVIOURS' COMPANY.—The members of this ancient Company dined together at the Guildhall Tavern on the 27th ult., under the chairmanship of Mr. Ex-Sheriff Burt, the Master. The Paviours' Company, although not so prominent as other and better-known City companies, possesses, according to the *City Press*, a good pedigree, for so far back as 1306, in the thirty-fifth year of King Edward I.'s reign, it is recorded that one William le Pavour held a tenement within the bar of Newgate, and he left twelvepence by his will towards the repair of London Bridge. Then during following years the Paviours' Company played an important part in the protection of the work of paviors, while there are quaint records of some rules and conditions in relation to the Paviours' Company. In 1673 the members of the trade subscribed money to obtain a charter for their Company, and the draft of the proposed charter passed the Privy Seal. For reasons not now known the City entered a *caveat* against the grant, and, although the Court of Aldermen were petitioned several times, the appeal was not successful, and the Company had to rest content with their ancient ordinances of the time of King Edward IV. Although the Paviours do not now exercise control over the trade, the present Court of Assistants are doing all in their power to promote its interests. With this view they, a few months ago, offered two prizes for essays on the best materials and manner of laying carriageway pavements in large cities. They decided in favour of the essay sent in by Mr. E. Spencer Saunders, of Sheffield; while the second best was that sent in by Mr. Nelson F. Dennis (who was not present); and honourable mention was made of that by Mr. J. Tasker (of Holborn).

WIDENING OF THREADNEEDLE-STREET.—At the meeting of the City Commission of Sewers on Tuesday last, a sum of 5,000*l.* was ordered to be paid for setting back the premises of 51, Threadneedle-street, to the line of improvement in that thoroughfare.

THE ENGLISH IRON TRADE.—The improvement in the English iron market continues, and although this is not so much perceptible in finished iron and steel, the advance in pig-iron is unmistakable. Cleveland pig, No. 3, has risen 3s. per ton from the lowest point, and is steady at its present price. The tendency in the Glasgow warrant market has been upwards during the last two weeks, and this movement has to some extent imparted itself to makers' iron. Higher prices are being obtained for Lancashire, Derbyshire, and Lincolnshire pigs, and rates are also stiffer in Staffordshire. Hematites in the North-west, on the contrary, are still lagging, and no better terms can be obtained by makers of Bessemer iron. The inquiry for finished iron shows a little more life, without, however, stimulating prices. The values of steel are tolerably steady, considering that the demand is still limited. The prospects of shipbuilders are anything but good. Engineers are fairly well employed, but not much new work is offering.—*Iron*.

BUSINESS CHANGES.—Mr. J. Williams Dunford has resigned his position as "official architect" to the Salvation Army. We are informed that he has carried out over 80,000*l.* worth of work for that organisation during the last two years. On leaving he was presented by his staff, numbering twenty-nine, with an illuminated address and other interesting souvenirs. He is commencing private practice.——Messrs. Peirson & Co., engineers and contractors, of 124, Fenchurch-street, write to inform us that in consequence of the death of Mr. J. O. Gardner, of the firm of Gardner, Anderson, & Clarke, 134, Fenchurch-street, London, the affairs of that firm are being wound up. Messrs. Peirson & Co. have made arrangements for continuing the business as engineers and contractors for constructional iron and steel work, and have taken over all the late firm's stock and effects, and opened new offices for this purpose at 124, Fenchurch-street.——Mr. W. Charles Evans, F.R.I.B.A., has removed from 3A, Poet's-corner, Westminster, to 25, Lowther-arcade, Strand, W.C.

THE ROMAN PAVEMENT AT WOODCHESTER.—Of the different Roman remains which excavators have brought to light of late years, for beauty of design and richness of colouring the pavement at Woodchester has been unsurpassed. This has long been acknowledged by those who have read the elaborate description which was published by the late Samuel Lysons, F.S.A., about the beginning of this century or have seen the specimen of the scroll-work which he presented to the British Museum. This pavement is about to be uncovered, and will remain so from Tuesday, July 29, till Monday, August 11, inclusive, during which time it will doubtless be visited by numbers who had not the opportunity of seeing it when it was opened for a short time ten years ago, as well as by many who then saw it and will be glad to visit it again. As it is within two miles of Stroud, on the Great Western line, and only about ten minutes' walk from Woodchester Station, on the Midland branch line, ample means of reaching the spot are provided for those living at a distance.—*Times*.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—The annual general meeting of this Institute was held on the 26th ult., Mr. T. S. Robertson, the President, in the chair. The report set forth that the roll for the past year contained the names of six honorary members, forty-nine members, and 150 associates. This year it contains seven honorary members, forty-nine members, and 152 associates. The balance in hand at the end of last year was 49*l.* 1s. 9½d.; this year it is 60*l.* 5s. The Institute having received a letter from the Master Builders' Association regarding the proposal made at a School Board meeting to delete the strike clause from their building contracts, instructed the Secretary to reply, "that they consider the strike clause, as agreed to between the Dundee Institute of Architecture and the builders of Dundee, in the general conditions of contract, necessary and just in building contracts, and they hope it will not be infringed." The report was adopted, and the office-bearers for the ensuing session were elected, the President being Mr. Charles Ower, and the Honorary Secretary, Mr. J. J. Henderson.

THE COUNCIL OF THE INSTITUTION OF CIVIL ENGINEERS have re-appointed as Treasurer Mr. Hugh Lindsay Antrobus, the senior partner in Messrs. Coutts & Co.; as Honorary Secretary Dr. William Pole, F.R.S.; and as the Secretary Mr. James Forrest, which office he has filled for the past thirty-four years.

ARTISAN STUDENTS.—The competition for the Oxford University Extension Scholarship has this year produced some remarkable results. Among the working men competitors were a dyer, a shoemaker, a joiner, several cotton weavers, and a mechanical draughtsman. The best essay on English poetry in the nineteenth century was written by a working plumber at Abergavenny. A capital essay on Strafford was sent in by a machine joiner from Oldham, while the educational influence of co-operative industry is perhaps indicated by the fact that two of the best essayists are employed as cotton weavers in the Nutclough Co-operative Factory at Hebden Bridge.—*Pall Mall Gazette*.

"ARCHITECTURE-REVUE."—In *L'Architecture* for June 28 will be found the whole of the little comedy written by M. Chas. Garnier, under the title "Architecture-Revue," which was played at the Hotel Continental after the annual dinner of the Congress of French Architects.

LEGAL.

EDWARDS V. BARNES.

THIS was an action tried in the High Court of Justice on the 30th ult., before Mr. Justice Grantham and a common jury, brought by a landlord against a tenant to recover damages for breach of an agreement to keep certain demised premises in repair.

The plaintiff, Sir Henry Edwards, is the owner of a mill called King's Mill, in the parish of Nutfield, in the county of Surrey, and by an agreement in writing, dated November 30, 1884, this mill, with the water-wheel, stables, outbuildings, and two cottages, and a piece of meadow-land adjoining the mill and cottages of about six acres, was let to the defendant for the term of one year at the yearly rent of 60*l.* The agreement contained the following term as to repairs:—"The tenant agrees with the landlord . . . . to keep the said mill, cottages, buildings, and premises (including the fixtures) in good repair and condition (damage by fire excepted)." The defendant entered into occupation and continued to occupy until September 29, 1889, when the tenancy was duly terminated by notice. The plaintiff's case was that the defendant had not kept the mill, cottages, and premises in good repair in accordance with the terms of the agreement, and claimed a sum of 74*l.* as damages for the dilapidations. The defence was that the premises were old and out of repair at the commencement of the tenancy, and the defendant paid into Court the sum of 20*l.*, saying that sum was sufficient to satisfy the plaintiff's claim.

Evidence having been given on both sides, at the close of the case,

His Lordship summed up, saying that the case was one which ought never to have been brought before a jury, but ought to have been referred.

The jury found that 18*l.* was sufficient.

His lordship thereupon gave judgment for the defendant, with costs.

CLIFFE V. THE RURAL SANITARY AUTHORITY OF POTTERSPURY.—SAME V. THE DUKE OF GRAFTON.

These cases were heard together, in the Queen's Bench Division, before Mr. Justice Denman, without a jury. They had occupied the attention of his lordship on several previous occasions. He now gave judgment.

The circumstances were shortly these. The village of Potterspury is on the borders of Northamptonshire, and it mostly belonged to the Duke of Grafton, but the plaintiff owned a water-mill and some cottages there. Previous to 1883 the drainage was imperfect; in that year typhoid fever broke out, and amongst those who died of the disease was the then Duke of Grafton. The present Duke thereupon constructed a system of drainage for that place, the outfall being into the stream that supplied the plaintiff's mill. The Local Sanitary Authority took over this system of drainage, but since then other works were constructed, which, it was said, carried the drainage free of the stream.

The plaintiff now sued for damages upon the ground that his stream had been fouled and his mill-pond filled up, and he asked for an injunction to prevent these things occurring in the future. In the course of the case it was said that the plaintiff would be content if his mill-pond were cleared out at a cost of some 125*l.*

Mr. Justice Denman went through the circumstances which had been proved in evidence before him, and said that under all the circumstances he was of opinion that the plaintiff had failed to make out a case against either the Sanitary Authority or the duke.

Judgment for the defendants with costs, but execution was stayed with a view to an appeal.

MEETINGS.

MONDAY, JULY 7.

Royal Institution.—General Monthly Meeting. 5 p.m.
Clerks of Works' Association (Carpenters' Hall).—Mr. T. Edmond on "Lighthouses." 8 p.m.

TUESDAY, JULY 8.

Royal Institute of British Architects.—The President's *Conversazione* at the Natural History Museum, Cromwell-road. 9 p.m.
Royal Society of Antiquaries of Ireland.—Meeting at Athlone.

WEDNESDAY, JULY 9.

Liverpool Engineering Society.—Excursion to the Manchester Ship Canal Works.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

9,807.—*Bolts for Double Doors: J. Upton.*—The fastening, which is the subject of this patent, holds one of the doors in a close and rigid position whenever the other door is closed. It is actuated by a spring catch moved by the pressure of the second door when closed. Other mechanical arrangements are included for operating the fastening at a distance from the doors when required.

10,552.—*Lathe Attachment for Shaping Wood: G. Prietz.*—To form fluted patterns, gear wheels, &c. Specially-shaped cutters are carried on a spindle moved by the same motor that actuates the lathe.

12,292.—*Compound for Paint: R. Condy.*—Sulphate of lead, when intended for a pigment, is so treated by this inventor that, when ground in oil, it possesses the property of quickly drying and having a good body. Oxide of lead is added, preferably the hydrated oxide of lead, the method for precipitating which is described.

13,228.—*Painters' Brushes: J. Oates.*—On the head or handle of the brush, which is the subject of this patent, is formed a hook or fringe projecting from one side of the brush, so that when the brush is placed in a can of water or oil, this hook or fringe engages with the upper edge of the can, and is supported thereby in the liquid without the lower points of the bristles touching the bottom of the can. The bristles are thus kept clear of any sediment lodging at the bottom of the oil-vessel, and the handles do not become daubed with paint or varnish.

20,554.—*Chimney-pots: J. Jones.*—This invention consists of a cylindrical zinc pot, which has flanges or collars fixed on the outer side, to prevent an upward current of air passing up or reaching the top of the pot. In the inside of the pot is an extra space (formed by the outer flanges or collars) to exhaust any tendency to a downward current of air.

1,565.—*Preventing Wood Fungus: J. H. Timm, Germany.*—According to this specification, the growth of wood fungus resulting from the material, clay, earth, &c., used for filling up the space between the beams and the boards, is prevented by covering the surfaces with incombustible or impregnated cardboard—*carton-pierre*—so as to completely insulate the beams and boards from the filling material.

NEW APPLICATIONS FOR PATENTS.

June 16.—9,268, H. Fourness, Promoting Ventilation and Preventing Down-Draughts.—9,277, E. Brightman, Sash-fastener for Windows.—9,305, C. Thode, Door-springs.—9,306, C. Howe, Testing the Setting Properties of Cements and Plasters.—9,321, Don De la Sala, Joinery.

June 17.—9,328, W. Fairweather, Roofing or Sheathing Tiles.—9,345, H. Holland and W. Carter, Sash-fasteners.—9,372, C. Rogers, Wood Screws.—9,384, D. Close, Bricks.

June 18.—9,406, J. Kaye, Bolts for Doors, &c.—9,422, W. Lester, Glazing-bars or Astragals.—9,440 and 9,441, H. Schlund, Hinges.—9,465, A. Moore and H. Petts, Street Metal Roofing.

June 19.—9,489, J. & A. Duckett, Water-closets.—9,524, C. Walton, Brick and Tile Machinery.—9,536, H. Lake, Metallic Lathing.

June 20.—9,562, R. Holden, Joiners' Tool.—9,564, W. Thompson, Sewers.—9,580, W. Eddleston, Fasteners for Windows.

June 21.—9,618, J. Bloomfield, Enamelled Bricks, &c.—9,637, B. Edwards, Roofing Tiles or Slates.

PROVISIONAL SPECIFICATIONS ACCEPTED.

6,783, F. Tyerman, Securing Window Fastenings.—7,079, J. Mason, Door Spring and Check.—7,153, W. Stock, Syphon Cisterns.—7,184, C. Edwards, Drain-pipes, &c.—7,365, C. Bonne, Clamp.—7,466, W. Wittorf, Flushing Apparatus for Water-closets.—7,707, D. Bostel, Flushing Water-closets.—7,783, J. Green, Water-waste Preventers for Cisterns, &c.—8,668, B. Piffard, Varnishes.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

12,559, J. Bristow, Repairing Slated Roofs.—13,046, W. Bramwell, Chimney Tops.—2,560, R. & F. Ambrose, Window Sashes and Frames and other articles hung by weights.—6,174, W. Thompson, Doorknobs and Fixing same to Spindles.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JUNE 19.—By Messrs. Cobb (at Maidstone): "Woodsend Farm," Boughton Malherbe, Kent, 37a. 2r. 4p., f., 840*l.*

JUNE 20.—By Messrs. Cobb (at Sittingbourne): a plot of f. land, near to Sheerness, 4a. 2r. 11p., 590*l.*; f. marsh land, 34a. 2r. 18p., 1,510*l.*; enclosures of f. marsh land, 82a. 1r. 32p., 2,000*l.*

JUNE 23.—By Fuller & Fuller: i.g.r. of 150*l.*, Peckham, g.r. £114. 10s., u.t. 87 years, 600*l.*; 4a, York-grove, u.t. 88 yrs., g.r. £7, r. £38, 400*l.*; Nos. 32 and 34, Holloway-rd., f., r. 97*l.* 12s. p.a., 1,020*l.*; 16, Swan-yd., Highbury, u.t. 23 yrs., g.r. 10*l.*, r. 27*l.* p.a., 220*l.*

JUNE 24.—By Messrs. Cobb (at Rochester): F.g.r. of 5*l.*, Chatham Hill, with reversion in 13 yrs., to 92*l.* 6s. p.a., 350*l.*; A plot of f. fruit land, Gillingham, 2a. 1r. 13p., 1,450*l.*; part of "Crown Farm," 93a. 2r. 2p., f., 2,500*l.*; part of "Crown Farm," 24a. 2r. 24p., f., 725*l.*; West Hoath Wood, 9a. 0r. 14p., f., 170*l.*—By E. & H. Lumley: 15, Duke-st., St. James's, f., r. 140*l.* p.a., 3,700*l.*—By Chesterton & Sons: 1 and 4, St. Mary's-sq., Harrow-rd., and a l.g.r. of 7*l.* 10s., u.t. 49 yrs., g.r. 22*l.* 10s., r. 105*l.* p.a., 1,130*l.*; 9 & 10, St. Mary's-sq., u.t. 49 yrs., g.r. 22*l.* 10s., r. 105*l.*, 1,200*l.*; 38, Blomfield-st., u.t. 52 yrs., g.r. 7*l.* 7s., r. 60*l.*, 440*l.*—By D. Smith, Son & Oakley: "The Old Red Lion," Barnet, p.h., and 10a. 2r. 16p., f. and c., r. 55*l.* 12s., 2,800*l.*; 101, 103 & 105, High-st., f., r. 69*l.* 12s., 1,225; 111, High-st., f., r., 17*l.* 10s., 560*l.*; a plot of f. garden-land, 20*l.*; an enclosure of f. land, 6a. 2r. 28p., r. 20*l.*, 460*l.*; a plot of copyhold-land, 0a. 3r. 18p., 65*l.*; three f cottages, r. 31*l.* 4s., 430*l.*; two plots of land C, 90*l.*; Nos. 56, 58, 60, 105 & 107, Wood-st., c, r., 62*l.* 8s., 630*l.*; 57, Wood-st., and enclosures of land, 14a. 0r. 12p., r. 80 pa., 2,660*l.* By Beal, Son, & Chartres: Two plots of f. land, Slough, 2a. 0r. 3p., f., 760*l.*; 1 and 2 Poplar Cottages, f., r. 49*l.*, 850*l.*; 1 to 4, Tetsworth Cottages, f., r. 42*l.*, 590*l.*; the residence, "Hillersden," u.t. 74 yrs., g.r. 12*l.* 10s., r. 170*l.*, 2,400*l.*; the residence, "Bramcote," u.t. 74 yrs., g.r. 12*l.* 10s., 2,650*l.*; two f. cottages and Stabling, 550*l.*; a set of f. stabling, r. 25*l.* p.a., 300*l.*; 8, Church-st., and two cottages, f., r. 42*l.* p.a., 620*l.* By Debenham, Tewson, & Co.: 92, 100, 104, 108, 110, and 112, Hill-st., Peckham, f.r. 162*l.*, 1,810*l.*; 118 and 120, Hill-st., f r. 40*l.* p.a., 540*l.*; three f. cottages and a laundry, Walthamstow, 820*l.*—By Wallen & Clunn: 55, Westbourne-ter., Hyde-pk., u.t. 47 yrs., g.r. 45*l.*, 2,700*l.*

JUNE 25.—By Weston & Son: 17, Croxted-rd., Dulwich, u.t. 54 yrs., g.r. 5*l.*, r. 30*l.*, 250*l.*—By J. W. Neighbour: 19, Bryon-st., Blandford-sq., u.t. 51 yrs., g.r. 3*l.* 15s., r. 23*l.* 8s., 180*l.*—By Protheroe & Morris: The f. residence "High Stone House," New Wanstead, r. 50*l.*, 820*l.*; 1 and 2, Sarah-villas, f., 1,200*l.*; "Deal House," c., r. 93*l.* p.a., 1,400*l.*; a plot of f. land, 350*l.*—By Baxter, Payne, & Lepper: 1 to 8, Grayville-ter., Sidcup, Kent, f., r. 187*l.* 4s., 1,400.—By Mullett, Booker, & Co.: 9, Devonshire-st., Hyde Pk., u.t. 45 yrs., g.r. 25*l.*, r. 165*l.*, 1,710*l.*; 52, Oxford-ter., u.t 42 yrs, g.r. 10*l.*, r. 100*l.*, 1,050*l.*; Lancaster-gate, f.g.r. of 48*l.* p.a., with reversion in 71 yrs., 1,240*l.*—By R. J. Collier: "The Hollies," Bembridge, I. of W., u.t. 997 yrs., g.r. 5*l.*, 600*l.*—By Norton, Trist, & Gilbert: f.g.r. of 70*l.*. Blackfriars-rd., with reversion in 78 yrs., 1,770*l.*; 44, Blackfriars-rd., f., r. 80*l.*, 1,160*l.*; Nos. 283 and 5 and 5a, Newcastle-pl., Edgware-rd., u.t. 38 yrs., g.r. 15*l.* 15s., r. 145*l.*, 1,400*l.*; 287, Edgware-rd., u.t. 38 yrs., g.r. 10*l.* 10s., r. 95*l.*, 1,260*l.*; 293, Edgware-rd., u.t. 8 yrs., g.r. 9*l.*, r. 70*l.*, 400*l.*—By Wyatt & Son (at Chichester): "Moats Farm," near Chichester, and 47a. 0r. 22p., f., r. 101*l.*, 1,500*l.*

JUNE 26.—By C. P. Whiteley: 4, Bartholomew-pl., Bartholomew-close, f., r. 25*l.* p.a., 400*l.*—By A. R. Savage & Son: Nos. 473 and 475, Mile End-rd., u.t. 12 yrs., g.r. 28*l.*, r. 93*l.*, 285*l.*—By J. Lees & Burchell: 38, Morgan-st., Whitechapel, E, r. 46*l.* 16s., 305*l.*; 74, Kynaston-rd., Stoke Newington, u.t. 74 yrs., g.r. 6*l.*, r. 28*l.*, 205*l.*—By Cole, Blackwell, & Cole: 55, Milton-rd., Hornsey, f., r. 30*l.* p.a., 410*l.*—By A. & G. Guiver: 4 to 7, Edith-villas, Edmonton, u.t. 83 yrs., g.r. 16*l.*, r. 79*l.* 6s., 300*l.*; High-street, Ponder's-end, f. coffee-house, r. 25*l.* p.a., 460*l.*; four f. cottages, r. 46*l.* 10s. p.a. 450*l.*; two f. houses with shops, r. 41*l.* 12s. 460*l.*; 1 to 10, Goat-lane, f., r. 89*l.* 14s. p.a., 670*l.*; Duck Lees-rd., a plot of f. land, 250*l.*; 6 to 14 (even), Balcrone-st., South Hackney, u.t. 50 yrs., g.r. 10*l.* 10s., r. 96*l.* 4s., 570*l.*; "The Three Crowns" public-house, Fore-st., Edmonton, r. 65*l.* p.a., f., 3,060*l.*; a f. house and shop in Fore-st., r. 30*l.* p.a., 600*l.*; a plot of f. land, Raynham-rd., 20*l.*; Lower Gordon-rd., Enfield, a plot of f. land, 38*l.*; By E. Stimson: 74, Lausaune-rd., Peckham, u t. 69 yrs., g.r. 6*l.* 5s., 235*l.*; 3 to 7, Railway-ter., Lewisham, u.t. 73 yrs., g.r. 21*l.* 2s., r. 104*l.*, 460*l.*; 47, 48 & 49, Margaret-st., Clerkenwell, and 17 to 20, Merlin-pl., u.t. 25 yrs., g.r. 21*l.* 6s., r. 199*l.* 6s., 850*l.*; 127 to 139 (odd), Creek-rd., Deptford, u.t. 31 yrs., g.r. 28*l.*, r. 211*l* 10s., 850*l.*—By Dyer, Son, & Hilton: The Residence "Claverley," Pond-rd., Blackheath, u.t. 8 yrs., g.r. 11*l.*, 377*l.*—By C. C. & T. Moore: 63, St. Stephen's-rd., North Bow, f., r. 31*l.* 4s., 350*l.*; 196, Rhodeswell-rd., Limehouse, f., r. 26*l.*, 210*l.*; 14, 16 & 18, Dora-st., u.t. 19 yrs., g.r. 6*l.*, r. 63*l.* 14s., 265*l.*; 10, 63 to 66, Ely-ter., Mile End, u.t. 20 yrs, g.r. 5*l.* 2s., r. 104*l.*, 395*l.*; 23, Dean-st., Commercial-rd., u.t. 7 yrs., g r. 8*l.*, r. 31*l.* 4s., 32*l.*—By Newbon & Harding: 89 to 95 (odd), Caledonian-rd, King's-cross, u.t. 53 yrs., g.r. 20*l.*, r. 167*l.* 10s., 2,020*l.*; "The Talbot" Public-house, u.t. 53 yrs, g.r. 15*l.*, r. 90*l.*, 2,500*l.*; 1, 3 & 5, Wharfdale-rd., u.t. 53 yrs., g.r. 15*l.*, r. 125*l.*, 1,165*l.*; 32 and 34, Balcombe-st., Dorset-sq., u.t. 31 yrs., g.r. 14*l.*, r. 120*l.*, 1,130*l.*, Church-pl., Paddington, i.g.r. of 100*l.*, g.r. 42*l.*, u.t. 47 yrs., 945*l.*; 4, 7, and 8, Railway-pl., King's-cross, u.t. 54 yrs., g.r. 15*l.*, r. 101*l.* 8s., 635*l.*; 186, Arlington-rd., Camden-town, u.t. 21 yrs., g.r. 4*l.* 10s., r. 36*l.*, 195*l.* By P. Matthews: 26, Church-road, Homerton, c. and f., r. 35*l.* p.a., 450*l.*; 29 and 33, Grove-rd., Wanstead, f., r. 64*l.* p.a., 800*l.* By Farebrother, Ellis, & Co.: f.g.r. of 6*l.* 10s., Dulwich, with reversion in 76 yrs., 160*l.*; f.g.r. of 37*l.*, with reversion in 82 yrs., 925*l.*; f.gr. of 31*l.* 10s., with reversion in 80 yrs., 635*l.*; f.g.r. of 58*l.* 10s., with reversion in 80 yrs., 1,170*l.* By D. Watney & Sons: F.g.r. of 30*l.* p.a., Camberwell, with reversion in 70 yrs., 735*l.*; F.g.r. of 5*l* and a r. of 1*l.*, with reversion in 70 yrs., 115*l.*; F.g.r. of 37*l.* 10s., with reversion in 70 yrs., 935*l.*

JUNE 27.—By F. Hards & Bradley: 4, Stockwell-st., Greenwich, f., area 5,600 ft., 450*l.*; 37 and 38, Barmeston-rd., Catford, u.t. 87 yrs., g.r. 15*l.*, 300*l.*; 23, 25, and 27, Gill-st., Limehouse, u.t. 14 yrs., g.r. 10*l.* 7s., r. 83*l.* 4s., 130*l.*—By Ireland & Barker: 4, Charles-st., Lisson-grove, u.t. 70 yrs., g.r. 8*l.* 8s., 195*l.*—By Debenham, Tewson, & Co.: No. 108, Lambeth-rd., f., r. 52*l.* p.a., 770*l.*—By Protheroe & Morris: The f. house "Hollington," Wallwood-rd., Leytonstone, r. 45*l.*, 670*l.*; The f. house "Wellsville," Bulwer-rd., r. 45*l.*, 675*l.*—By E. Smith & Co.: The Residence "Elmfield," Harrow, and 1a. 3r. 3p., u.t. 63 yrs., g.r. 12*l.*, 3,000*l.*—By C. & H. White: "Strathfieldsay," Elms-rd., Clapham, u.t. 90 yrs., g.r. 9*l.*, 480*l.*; 18, 20, and 22, Walmer-st., Marylebone, u.t. 14 ys., g.r. 12*l.*, r. 124*l.* 16s., 275*l.*; 34, Queen's-row, Walworth, f., r. 32*l.*, 395*l.*; 3 and 4, Queen's-row, f., r. 64*l.*, 740*l*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	10	0	7	10	0
Teak, E.I. ....load	11	0	0	14	0	0
Sequoia, U.S. ....foot cube	0	2	3	0	3	0
Ash, Canada....load	3	0	0	4	10	0
Birch ,, ...	3	0	0	5	0	0
Elm ,, ...	3	10	0	4	15	0
Fir, Dantsic, &c....	1	15	0	3	10	0
Oak ,, ...	2	10	0	4	10	0
Canada	5	10	0	6	10	0
Pine, Canada red	2	10	0	3	10	0
,, yellow	2	0	0	5	5	0
Lath, Dantsic....fathom	5	0	0	6	0	0
St. Petersburg	5	0	0	7	0	0
Wainscot, Riga, &c. ....log	0	0	0	0	0	0
Deals, Finland, 2nd and 1st. std.						
100	7	15	0	10	0	0
,, ,, 4th and 3rd	7	0	0	7	10	0
Riga	6	0	0	8	10	0
St. Petersburg, 1st yellow	9	10	0	14	10	0
,, 2nd ,, ...	7	10	0	9	0	0
,, white	7	0	0	10	0	0
Swedish	7	0	0	15	0	0
White Sea	8	0	0	17	0	0
Canada, Pine, 1st	15	0	0	26	0	0
,, ,, 2nd	10	0	0	16	10	0
,, ,, 3rd, &c.	7	0	0	10	0	0
,, Spruce, 1st	8	15	0	11	0	0
,, ,, 3rd and 2nd ..	6	10	0	8	10	0
New Brunswick, &c.	6	0	0	8	0	0
Battens, all kinds	5	0	0	16	0	0
Flooring Boards, sq., 1 in., prepared, First	0	10	0	0	14	0
Second	0	8	0	0	10	6
Other qualities	0	6	0	0	7	9
Cedar, Cuba ....foot	0	0	4	0	0	4½
Honduras, &c.	0	0	4	0	0	4½
Mahogany, Cuba....	0	0	4½	0	0	6½
St. Domingo, cargo average ..	0	0	5	0	0	6½
Mexican ,, ...	0	0	4½	0	0	5½
Tobasco ,, ...	0	0	5½	0	0	6½
Honduras ,, ...	0	0	5	0	0	6½
Box, Turkey ....ton	5	0	0	13	0	0
Rose, Rio	14	0	0	19	0	0
Bahia	13	0	0	18	0	0
Satin, St. Domingo....foot	0	0	6	0	1	3
Porto Rico	0	0	9	0	1	3
Walnut, Italian	0	0	4	0	0	7
METALS.						
IRON—Bar, Welsh, in London tn	6	17	6	8	0	0
,, ,, at works in Wales	6	10	0	7	0	0
,, Staffordshire, in London..	8	0	0	8	10	0
COPPER—British, cake and ingot	63	0	0	63	10	0
Best selected	65	0	0	66	0	0
Sheets, strong	71	0	0	72	0	0
Chili, bars	59	7	6	0	0	0
YELLOW METAL....lb.	0	0	5½	0	0	0
LEAD—Pig, Spanish ....ton	13	15	0	0	0	0
English, com. brands	13	10	0	0	0	0
Sheet, English, 3 lbs. per square foot and upwards....	15	5	0	0	0	0
Pipe	15	10	0	0	0	0
TIN—						
Straits	94	0	0	0	0	0
Australian....	94	0	0	0	0	0
English Ingots....	99	0	0	0	0	0
OILS.						
Linseed ....ton	24	2	6	24	10	0
Cocoanut, Cochin	33	0	0	34	0	0
Cocoanut, Ceylon	27	10	0	0	0	0
Palm, Lagos	26	0	0	0	0	0
Rapeseed, English pale	31	0	0	0	0	0
,, brown	29	5	0	29	10	0
Cottonseed, refined	22	10	0	0	0	0
Tallow and Oleine	21	0	0	40	0	0
Lubricating, U.S.	5	10	0	6	0	0
,, refined	7	0	0	12	0	0
TAR—Stockholm....barrel	1	4	0	0	0	0
Archangel....	0	15	0	0	0	0

CONTRACTS AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer	Tenders to be delivered.
*Hot-water Heating, Shire Hall, Carmarthen	Joint Standing Com...	Daniel Phillips	July 5
*Wood Pavements	St. Giles Bd. of Works	G. Wallace.....	July 7
*Kerbing, Tarpaving, Metalling, &c., Work	Lewisham Bd. of Wks.	*Official*.....	July 8
*Pipe Sewers, &c.	Willesden Local Board	O. Claude Robson	do.
*Earthenware Sewer Pipes.....	Belfast Corporation ..	J. C. Bretland	do.
*Sewers Works	Islington Vestry.....	*Official*	do.
*Roadmaking Works.....	do.	do.	July 9
*Iron Escape Staircases.....	Hampstead Guardians	C. Bell	do.
Alterations, St. Mary's Church, Maryport	Lanc. & Yorks. Rlwy	C. J. Ferguson, F.S.A.	do.
Engine Shed at Southport.....	Tynemouth R.S.A.....	*Official*.....	do.
Cast-iron Water-pipes and Fittings	Managers	do.	do.
Erection of Forres Leanchoil Hosp., N.B.	Manchester Corp.	H. Saxon Snell	July 10
Wrought-iron Railings, Gate, Pillars, &c.	Bd. of Public Works..	*Official*	do.
Constabulary Barracks, Belfast	Com. Cardiff & South	do.	do.
New Bridge, &c.....	Wales Horse Show ..	do.	July 11
Erection of Shedding, Horse Boxes, &c. ..	J. Lardner Green, Esq.	.....	do.
Residence, Salisbury	The Committee	John Harding & Son..	do.
*Erect. Vestries, &c. St. Mark's, S.Norwood		.....	do.
Lengthening Connswater Bridge, &c., (Co. Down, Ireland).....	Bd. of Public Works..	*Official*	July 12
Making New Roads (Co. Down, Ireland)	do.	do.	do.
Shedding and Yard Fittings, Leamington	Warwick Agri. Soc. ..	.....	do.
Public Hall, Newbridge (Mon.)	.....	A. D. Edwards.....	do.
Lodging-House, Newbridge (Mon.).....	Paddington Vestry ..	do.	do.
*Purchase and Removal of Granite Paving	do.	*Official*	July 14
*Stone-Hauling Carts	do.	do.	do.
*Erection of Sanitary Works.....	do.	do.	do.
Sanitary Work, &c.	London County Coun.	do.	do.
*Lowering and Repaving Road, Battersea	Staffordshire C. C.....	do.	do.
Road Metalling, &c.....	Sch. Bd. for London ..	do.	do.
*Purchase and Pulling down Building Mat.	.....	do.	do.
Thirty-nine Houses, Hebden Bridge, Yorks	Norton (Sheffield) Sch.	John Sutcliffe	do.
Enlarging, &c. School Buildings.....	Board	T. H. Wilson	do.
Twenty-eight Houses, Barry Dock.....	Maxwell Building Club	W. A. Lloyd.....	do.
*Engine House, Chimney Shaft, &c.	Cheshunt Local Board	T. Bennett	July 15
*Intercepting Sewer, &c.	Manchester Corp.	J. Allison	do.
*Repair of Tar and Asphalte Paving	Tottenham Local Bd.	J. E. Worth	do.
*Sewers, &c.	West Ham Council..	Lewis Angell	do.
*Engine House, &c.	Hoylake & West Kirby Gas, &c. Co.	C. H. Beloe	do.
*Enlargement of S. E. District Post-office..	Com. of H. M. Works	*Official*	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Clearance of Blocks of Buildings	West Ham Council ..	Lewis Angell	July 15
Police Stations, Northwich & Middlewich	Standing Joint Com...	*Official*	do.
Road Materials	Sheerness Local Board	do.	do.
*Materials for Wood Paving Works.....	Chelsea Vestry	T. W. E. Higgens	do.
*Iron Piles, Stays, &c. for Groynes	Sandgate Local Board	W. L. Barrett	do.
*Stone for Kerbing, &c.	Luton Corporation....	E. J. Lovegrove	do.
*Wood Paving and Asphalte Works	Westminster Vestry..	G. R. W. Wheeler	July 16
*Cycle Factory, Coventry	Coventry Machinists Co. Lim.	H. W. Chattaway	do.
*Repairs, &c. Hot-water Heating Apparatus	Fulham Union	*Official*	July 17
Building a new "Olympia," Belfast	Messrs. Ginnett	Saml. Stevenson.....	do.
Residence at Leigh, Westbury, Wilts	G. H. Knight, Esq. ..	Halliday & Anderson	July 18
*Granite Supply	Harrow Local Board..	E. R. Capon	July 19
*Coroner's Court, Mortuaries, &c.	Newington Vestry....	*Official*	July 21
*Supply of Vehicles for Cleansing	Whitechapel Bd. of W.	do.	do.
*Paving and Painting Bridges	London County Coun.	do.	do.
*Public Conveniences, Highbury Fields ..	do.	do.	do.
*Dredging	River Medway Conser.	do.	do.
*New School House, Mitcham	Holborn Union	H. Saxon Snell	July 23
*Repointing, Brick Walls, &c. at Infirmary	do.	do.	do.
*Extension of Sewers & House Connexions	Dorking Local Board	G. Somers Mathews'..	July 26
*Cast-iron Pipes, Sluice Cocks, &c. &c.	Tarporley Local Board	H. Bancroft	July 30
Police Quarters at Caerleon	Committee	*Official*	No date
New Bank, Manager's House, &c., Goole..	W. Beckett & Co.	H. B. Thorp	do.
Schools, Playsheds, &c.	Sheffield School Board	C. J. Innocent.....	do.
*Laying-out Streets and Erecting Cottages, Watford	L. & N. W. R. Co.	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised	Salary	Applications to be in
*Clerk of the Works	Dewsbury Union	.....	July 8
*Professorship of Mechanical Engineering	King's College	Not stated	July 9
*Clerk of Works	Tottenham Sch. Bd.	3*l* per week.....	July 10
*Superintendent of Sanitary Department—	St. Mary (Islington) Vestry	200*l.*	July 12
*Inspector of Street Cleansing	Birmingham Public Works Committee ..	3*l* per week	do.

Those marked with an Asterisk (*) are advertised in this Number. *Contracts pp* ii., xiii., *and* xiv. *Public Appointments,* xviii.

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BODMIN.—For additions, &c., to buildings at county lunatic asylum, Bodmin, for the Visiting Justices and Committee. Mr. W. J. Jenkins, architect, Bodmin :—

W. H. Buscombe	£1,320 0 0
Shelley & Sons	1,235 0 0
J. Rowe	1,120 0 0
G. Best	1,075 0 0
R. Grose (accepted)	1,050 0 0

[All of Bodmin.]

BROMLEY (Kent).—For constructing a new road at Bromley Common, for the Bromley Local Board. Mr. Hugh S. Cregeen, Surveyor :—

E. Peill & Sons	£965 0 0
T. Lansbury (accepted)	260 10 0

BROMLEY (Kent).—For making-up Yester-road, for the Bromley Local Board. Mr. Hugh S. Cregeen, Surveyor :—

J. C. Trueman	£340 0 0
E. Peill & Sons	247 17 6
T. Lansbury (accepted)	242 14 1

BROMLEY (Kent).—For sewer extension in Plaistow-lane, for the Bromley Local Board. Mr. Hugh S. Cregeen, Surveyor :—

J. C. Trueman	£126 0 0
T. Lansbury	116 17 0
E. Peill & Sons	113 0 0
J. Rose (accepted)	107 16 6

FAIRFIELD (Lancashire).—For the erection of a villa residence, coachhouse, and stables, for Mr. Wm. Johnston. Mr. J. H. Burton, architect, Ashton-under-Lyne :—

W. Hurst, Droylsden	£3,048 0 0
J. W. Williamson, Ashton-under-Lyne	2,906 0 0
E. & C. Jackson, Openshaw	2,902 0 0
Jabez Gibson, Dukinfield	2,860 0 0
Underwood Bros., Dukinfield	2,860 0 0
Fitton & Bowness, Ashton-under-Lyne	2,819 0 0
Thos Storer, Denton	2,800 0 0
R. Whitell, Manchester	2,799 0 0
Owen Williams, Manchester	2,797 0 0
Jos. Bates, Droylsden	2,780 0 0
Jos. Davison, Manchester	2,780 0 0
Jno. Robinson, Ashton-under-Lyne	2,733 0 0
C. Wallworth, Gorton (accepted)	2,650 0 0

FARNWORTH.—For decorative work at Farnworth Parish Church :—

R. Bennett, Manchester (accepted)	£350 0 0

HERTFORD. — For erecting new station hotel, Hertford, Mr. James Farley, architect, Hertford. Quantities by Mr. Theo. P. Pietersen, 191, Euston-road, London :—

Harris & Wardrop, London	£2,700 0 0
J. W. Falkner, London	2,095 0 0
H. M. Dove, Watford	2,030 0 0
Thomas Hunt, Ware	1,990 0 0
Henry Norris, Hertford	1,963 0 0
C. Miskin, St. Albans	1,963 0 0
John A. Hunt, Hoddesdon	1,950 0 0
Kirk & Randall, Woolwich	1,941 0 0
Claridge & Bloxham, Banbury	1,897 0 0
G. E. Wallis & Sons, Maidstone	1,888 0 0
W. Bell & Sons, Saffron Walden	1,867 0 0
S. F. Halliday, Stamford	1,862 0 0
S. & W. Pattinson, London	1,850 0 0
J. Wilmott & Sons, Hitchin	1,800 0 0
F. Dupont, Colchester	1,793 0 0
French & Ellwood, Sandy	1,746 0 0

LEICESTER.—For erecting St. Leonard's Vicarage, Leicester. Mr. J. C. Traylen, Diocesan Surveyor, architect :—

		Sewers.
Roberts Bros., Stamford	£1,198 0 0	£120 0 0
S. F. Halliday, Stamford	1,197 5 0	88 0 0
T. & E. Bentley, Leicester	1,158 0 0	73 0 0
T. & H. Herbert, Leicester	1,134 0 0	103 10 0
J. O. Jewsbury, Leicester	1,110 0 0	80 0 0
Clarke & Garrett, Leicester*	1,100 0 0	95 0 0
T. Bland & Son, Leicester	1,075 0 0	97 10 0
N. Elliott, Leicester	1,072 5 0	93 10 0
T. Hutchinson, Leicester	1,054 10 0	90 16 0
H. Bland, Leicester	1,040 0 0	85 0 0
G. Duxbury, Leicester*	999 0 0	79 0 0

* Accepted.

LONDON.—For the erection of a school to provide accommodation for 789 children on the site in Ancona-road, Plumstead, and also for the erection of a schoolkeeper's house, with a cookery classroom underneath, for the School Board for London. Mr. T. J. Bailey, Architect :—

		If brickwork is built in cement.
Colls & Sons	£16,419	£16,651
Dove Bros.	16,234	16,438
Patman & Fotheringham	16,189	16,404
B. E. Nightingale	16,117	16,274
J. Grover & Son	16,010	16,235
E. Lawrance & Sons	15,923	16,133
Stephens, Bastow & Co.	15,828	15,978
Killby & Gayford	15,615	15,806
J. Mowlem & Co.	15,610	15,750
Kirk & Randall	14,827	15,052*

*Recommended by the Works Committee for acceptance.

LONDON.—For the erection of a covered playground for the boys' department of the Belvedere-place School, Borough-road, for the School Board for London. Mr. T. J. Bailey, Architect :—

H. Mallett	£276 0 0
W. Hammond	244 0 0
Maxwell Bros.	219 0 0
The Co-operative Builders, Limited	210 0 0
H. & H. F. Higgs*	207 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For supplying heating apparatus on the low-pressure hot-water system to the Junior Mixed School, now in course of erection on the "Latchmere" site, Battersea Park-road, and also extending the apparatus to the graded school, for the School Board for London. Mr. T. J. Bailey, Architect ;—

W. W. Phipson	£1,150 0 0
J. G. Wagstaff	961 0 0
Longden & Co.	866 10 0
J. & F. May	862 0 0
C. J. Kinnell & Co.	850 0 0
Rosser & Russell	764 10 0
Wontner Smith, J. Gray, & Co.	759 0 0
Purcell & Nobbs	634 0 6*

* Recommended by the Works Committee for acceptance.

LONDON.—For work to be done in constructing an iron girder footway-bridge, with approaches, over the West London and London, Chatham, and Dover Railways, at Culvert-road, Battersea, for the London County Council. Mr. Binnie, Engineer :—

J. Dickson	£3,647 0 0
Holme & King	3,138 0 0
Alfred Thorne	2,776 0 0
Geo. Double	2,670 0 0

LONDON.—For pulling down and rebuilding "The George and Dragon," New North-street, for Messrs. Matthews & Canning. Messrs. Karslake & Mortimer, architects :—

Holloway Bros.	£1,705 0 0
Toten & Sons	1,630 0 0
Picken, Chelsea	1,584 0 0
McCormack & Sons	1,576 0 0
Patman & Fotheringham	1,520 0 0

LONDON.—For rebuilding 46, Kennington-road. Messrs. Hudson & Booth, 17, Godliman-street, E.C., architects. Quantities by Mr. H. Lovegrove, 26, Budgerow, E.C. :—

W. Larter & Son	£2,275 0 0
John Greenwood	2,183 0 0
J. Morter	2,115 0 0
Hall, Beddall & Co.	2,110 0 0
F. and H. F. Higgs	2,084 0 0
Spencer & Co.	2,080 0 0
S. J. Jerrard	1,987 0 0

LONDON.—For the supply of 1,500 cubic yards of blue Guernsey granite road metal at Brentford, for the Brentford Local Board. Mr. J. H. Strachan, Surveyor, Clifden House, Boston-road, Brentford :.

	Per cubic yard. s. d.
Fennings & Co., London Bridge	15 4
Nowell & Robson, Kensington	15 4
A. & F. Manuelle, Leadenhall-street	15 2
Mowlem & Co., Westminster (accepted)	14 11

LONDON.—For redecoration and other work to Walworth-road Chapel. Mr. John Edward Sears, architect :—

Wm. Sayer	£595 0 0
G. Schickelmann	565 0 0
W. Hayward & Son	540 0 0
Laws & Son	483 0 0
Pitman & Son	438 0 0

LONDON.—For repairs, painting, &c., to the chapels, lodges, &c., at Tooting Cemetery, for the Burial Board of Lambeth. Mr. W. Chutter, surveyor :—

Fitch	£107 7 0
Reddish	94 10 0
Mallett	78 0 0

LONDON.—For supplying additional furniture and fittings for the new rooms under the Council Chamber at Spring-gardens, for the London County Council. Mr. Thomas Blashill, Architect :—

Gregory & Co.	£285 18 6
Vaughan & Co.	238 15 0
Newson & Co. (accepted)	188 10 0

LONDON.—For the erection of new gateways, &c., at their dispensary, East-street, Marylebone, W., for the Guardians of the Poor of the Parish of St. Marylebone. Mr. H. Saxon Snell, architect, London :—

Wall Bros., Kentish Town	£429 0 0
Wm. Bamford, Pentonville	410 0 0
W. H. Lorden & Son, Upper Tooting	379 0 0
Thos. Nye, Ealing, Middlesex	339 0 0
G. Godson & Sons, Kilburn	313 0 0

LONDON. — For alterations and additions to the "Spanish Patriots" tavern, White Conduit-street, Islington, for Messrs. F. J. Newport & Co. Mr. Fred. G. Grierson, architect, 9, Old Jewry-chambers, E.C. :—

H. H. Hollingsworth	£294 0 0
S. Goodall	285 0 0
Courtney & Fairbairn	258 0 0
Olver & Richardson	253 0 0
F. Vollar, Wood-green	251 0 0

LONDON.—For lowering basement and constructing new buffet and various alterations at 122, Newgate-street, E.C., for Messrs. Diviani Bros. :—
Howell J. Williams, Bermondsey-street (accepted) £887 10 0
[No competition.]

LONDON.—For extra work to be done in connexion with pontoons, grid, dolphin, watermen's steps, &c., at the Woolwich Ferry, for the London County Council. Mr. Binnie, Engineer :—
John Mowlem & Co. * £1414 0 0
[Only one tender received.]

MORTLAKE (Surrey).—For the erection of a Conservative Club, for the Mortlake Conservative Club Company, Limited. Mr. Thomas Potter, architect, Sevenoaks :—

	Club and hall. £. s.	For gallery. £. s.	Time.
J. Hill, Barnes	3,768 18 ..	195 10 ..	6 months.
D. Charteris, London..	2,937 0 ..	160 0 ..	7 months.
R. G. Hughes, Mortlake	2,822 0 ..	175 0 ..	No time.
Killby & Gayford, Finsbury	2,867 0 ..	157 0 ..	5 months.
Goddard & Sons, Farnham	2,845 0 ..	162 0 ..	9 months.
G. W. Heasler, Richmond	2,835 0 ..	179 0 ..	—
Lansdown, Richmond..	2,820 0 ..	169 0 ..	—
Wallis & Sons, Maidstone	2,794 0 ..	148 0 ..	6 months.
A. Hunt, Barnes	2,719 0 ..	146 0 ..	6 months.
G. Toms,* Camdentown.....	2,719 0 ..	128 0 ..	4 months.
Egan & Co., Mortlake..	2,705 0 ..	130 0 ..	6 months.

* Accepted subject to deductions.

SALISBURY.—For repairs and alterations at Laverstock Farm-house, near Salisbury, for Mr. Charles Blake. Mr. Fred. Bath, architect, Salisbury :—
J. Rawlings, Salisbury £470 6 0
Gilbert Harris, Salisbury..... 462 10 0
E. Witt, Salisbury 453 0 0
E. Day, Salisbury 401 8 6
J. M. Jenkins, Salisbury 370 0 0
T. Grace, Fulflood, Winchester..... 364 18 0
J. Wort, Salisbury 304 6 0
A. & J. S. Curtis, Salisbury * 297 0 0
* Accepted.

SALISBURY. — For alterations and additions to Fisherton National Schools, for the trustees. Mr. Fred. Bath, architect, Salisbury :—
H. J. Rite, Salisbury (accepted) £193 0 0

SALISBURY. — For new room at the Maundrel Memorial Hall, for the trustees. Mr. Fred. Bath, architect, Salisbury :—
W. J. & C. S. Young £295 0 0
H. J. Rite (accepted) 289 15 0
[Both of Salisbury.]

SHAMLEY GREEN (near Guildford). — For the erection of entrance-lodge on the estate of Mr. C. D. Hodgson. Mr. T. C. Barralet, architect, Bridge-chambers, Richmond, Surrey :—
Harvey Brown, Bramley (accepted).. £485 0 0

SOUTH SHIELDS.—For the erection of new studio and alterations at No. 8, Ogle-terrace, South Shields, for Mr. Wm. Parry. Mr. Henry Grieves, architect, Albany Chambers, South Shields :—
William Scott, South Shields* £463 7 0
* Accepted.

SOUTH STOCKTON.—For the erection of new public offices, for the South Stockton Local Board. Mr. J. M. Garry, architect, West Hartlepool :—
W. C. Atkinson, Stockton (accepted) £3,327 3 6
[Seven other tenders : highest, £4,300.]

WOLVERHAMPTON.—For the erection of villa residence, Tettenhall-road, for Mr. Rupert Belcher. Mr. Joseph Lavender, architect, Wolverhampton. Quantities by the architect :—
B. Guest £992 14 0
Bradney & Co..... 912 0 0
H. Gough 909 0 0
T. Hallchurch 904 0 0
G. Cave 875 0 0
C. Ford & Sons (accepted) 850 0 0
[All of Wolverhampton.]

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder" by *Friday Morning's post.*

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street W.C.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, 'THE BUILDER, LONDON.'

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.
Terms for Series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.
FOUR Lines (about thirty words) or under) ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.
*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to
DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front Page should be in by the same hour on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY mornings.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office,* 46, Catherine-street, Covent Garden, W.C. *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

Now ready.
READING CASES, { NINEPENCE EACH. { By post (carefully packed), 1s.

W. H. Lascelles & Co.
121, BUNHILL ROW, LONDON, E.C
Telephone No. 270.
HIGH-CLASS JOINERY.
LASCELLES' CONCRETE.
Architects' Designs are carried out with the greatest care.
CONSERVATORIES
GREENHOUSES,
WOODEN BUILDINGS,
Bank, Office, & Shop Fittings
CHURCH BENCHES & PULPITS
ESTIMATES GIVEN ON APPLICATION.

TO CORRESPONDENTS.

C. & C. (drawings received).—R. S. H.—T. F. P.—J. W.—F. C.—F. B.—P. W. T.—"Competitors."—A. C.—H. O. C.—F. A. M.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

BEST BATH STONE.
CORSHAM DOWN. | FARLEIGH DOWN.
BOX GROUND. | COMBE DOWN.
WESTWOOD GROUND. | STOKE GROUND
THE BATH STONE FIRMS, Limited.
HEAD OFFICES: BATH.

DOULTING FREESTONE.
THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.
THE BRAMBLEDITCH STONE. Is of the same crystalline nature as the Chelynch Stone, but finer in texture, and more suitable for fine moulded work.
Prices, and every information given, on application to CHARLES TRASK & SONS, Doulting, Shepton Mallet.
London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.

HAM HILL STONE.
The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent: Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, graneries, tun-rooms, and terraces. [ADVT.

SPRAGUE & CO.'S
INK-PHOTO PROCESS,
22, Martin's-lane,
Cannon-street, E.C. [ADVT.

DRY
MAHOGANY,
WAINSCOT, WALNUT, TEAK,
&c.
EXTENSIVE AND VARIED STOCK.
WILLIAM BLOORE,
80 to 90, BOND STREET, VAUXHALL, and
57 to 67, SOUTH LAMBETH ROAD, S.W.

F. BRABY & CO.'S PATENT GLAZING.
GLASS SET FREE,
ALLOWING EXPANSION AND CONTRACTION, AND PRECLUDING BREAKAGE.
ABSOLUTELY WATERTIGHT. PAINTING AND PUTTY SUPERSEDED.
OVER THREE MILLION FEET FIXED.
DRAWINGS AND PRICES ON APPLICATION.
MODELS AND SECTIONS ON VIEW.
LONDON: 352 to 362, EUSTON ROAD.
LIVERPOOL: 6 and 8, HATTON GARDEN.
GLASGOW: 47 & 49, ST. ENOCH SQUARE.

DRAWN BY Mr HERBERT RAILTON.

PHOTO-LITHO. SPRAGUE & Co 22, MARTINS LANE, CANNON ST., LONDON, E.C.

SHEFFIELD MUNICIPAL BUILDINGS: FINAL COMPETITION

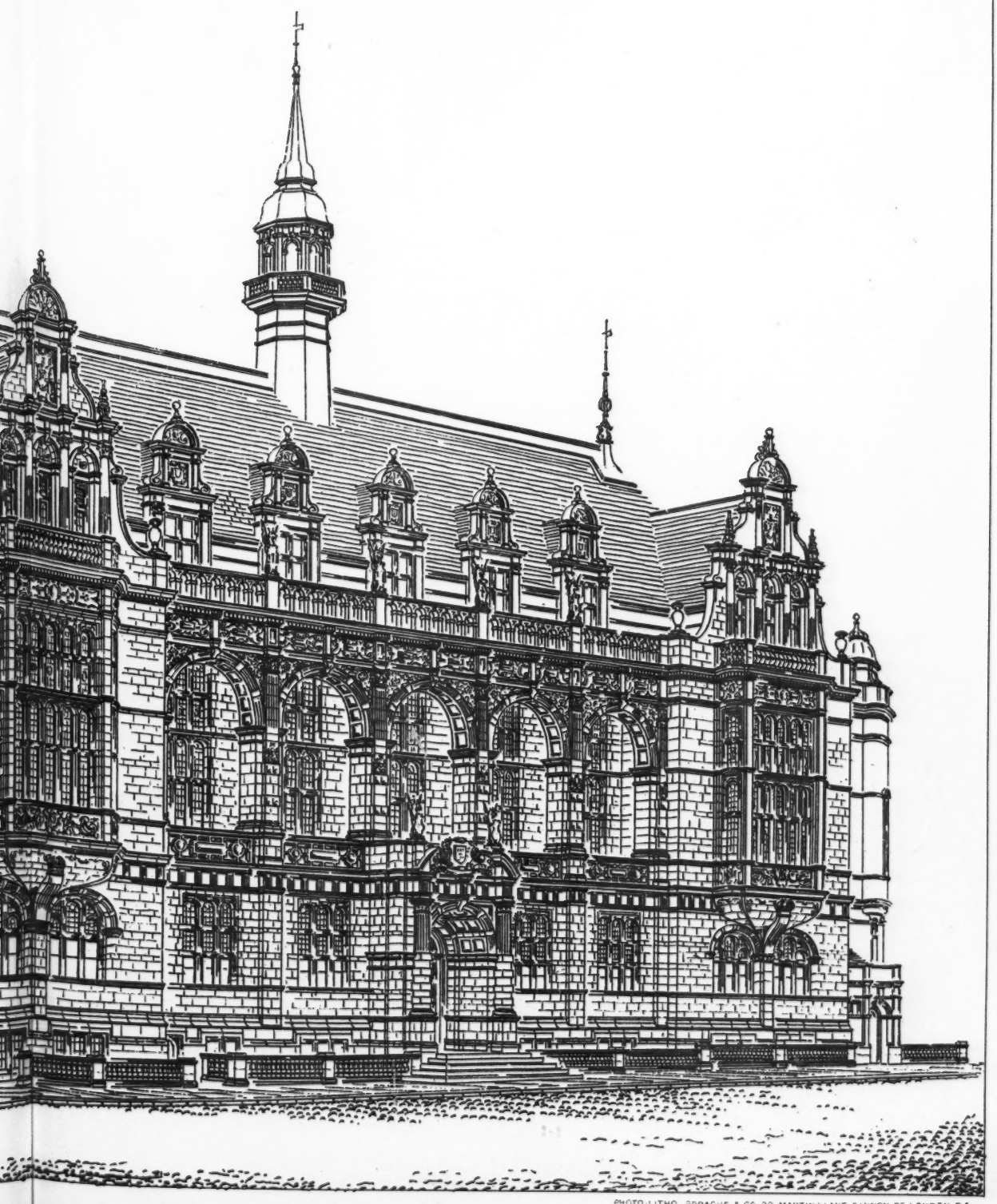


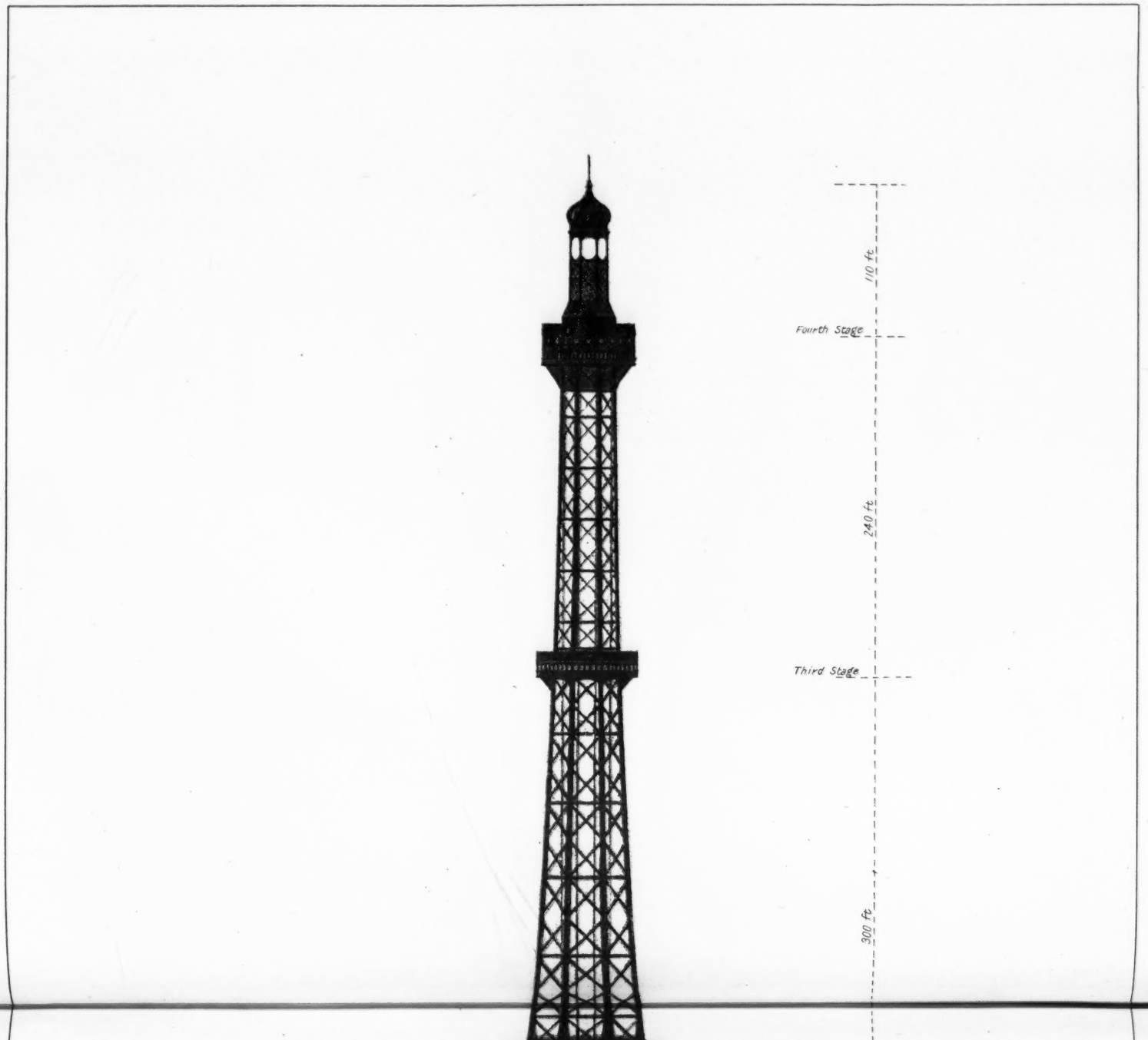
PHOTO-LITHO. SPRAGUE & Co. 22 MARTINS LANE CANNON ST. LONDON. E.C.

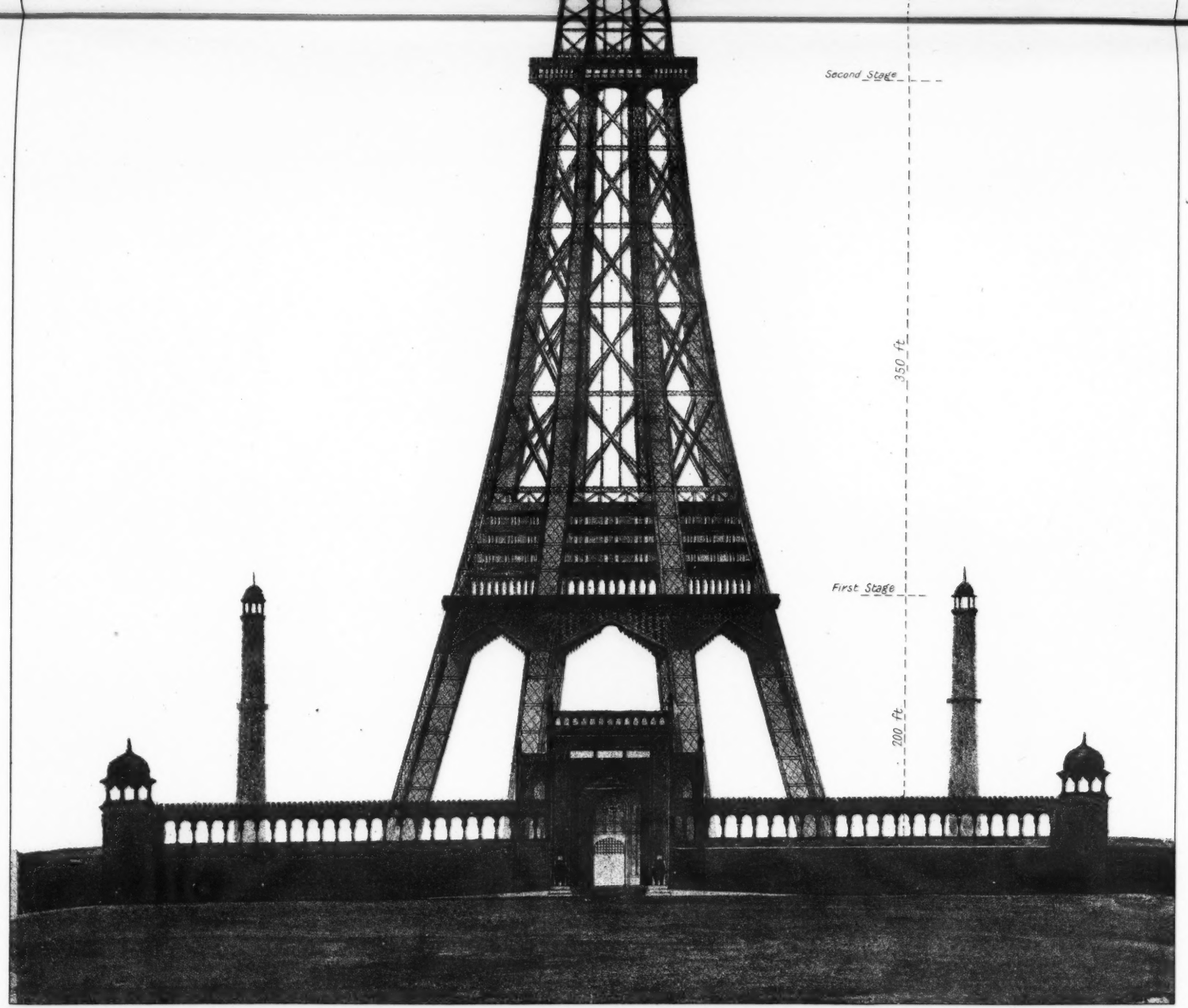
ETITION.—DESIGN SUBMITTED BY MR. H. T. HARE, A.R.I.B.A.

"INK-PHOTO", SPRAGUE & Co. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

"VELASQUEZ."—M. FREMIET, SCULPTOR.

Paris Salon, 1890.

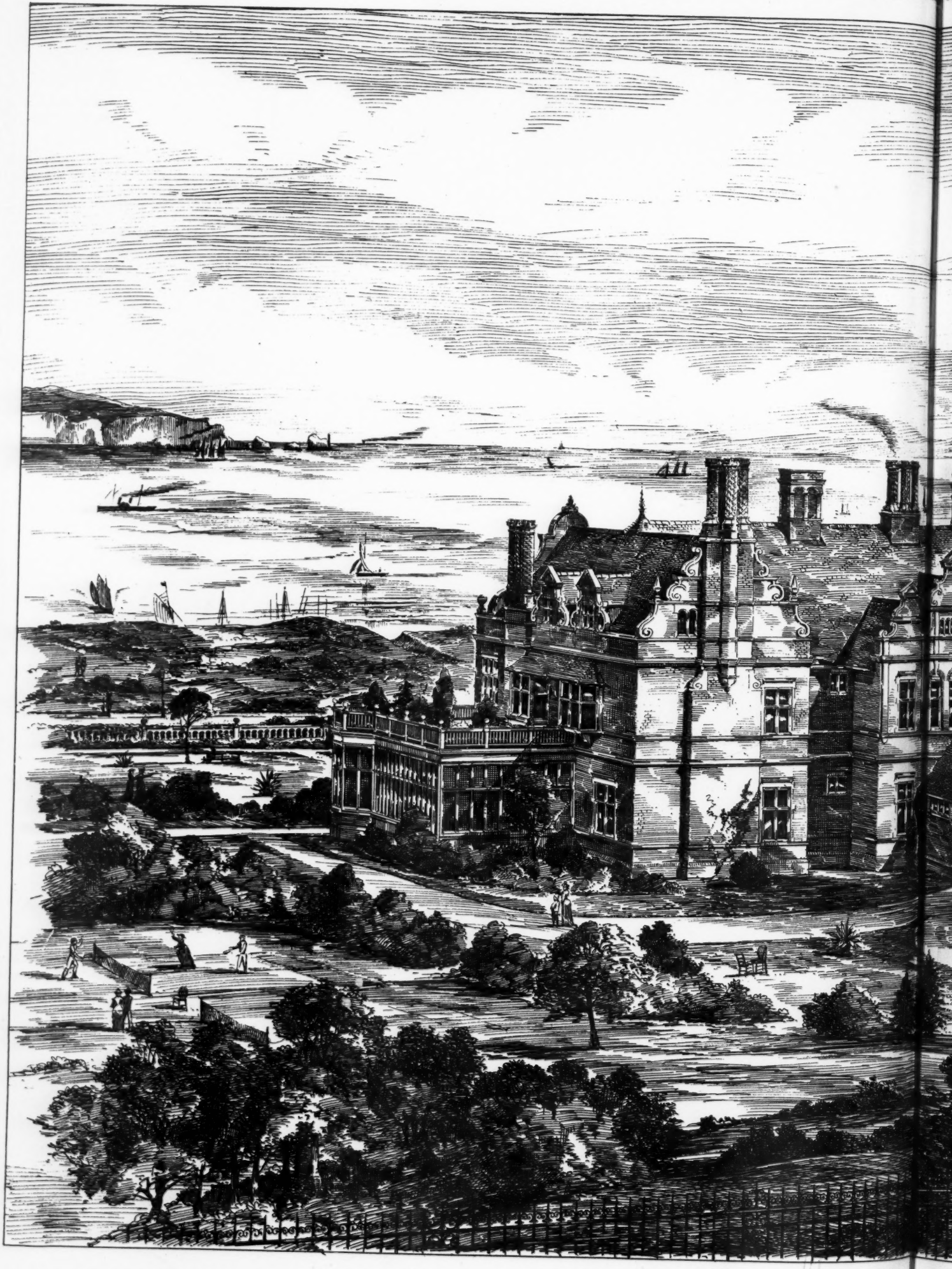

110 ft.
Fourth Stage
240 ft.
Third Stage
300 ft.



"INK-PHOTO," SPRAGUE & Co. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

FIRST PREMIATED DESIGN FOR PROPOSED "EIFFEL TOWER" FOR LONDON.

MESSRS. STEWART, MACLAREN, & DUNN, ARCHITECTS.



VICTORIA HOTEL, MILFORD-ON-SEA, HANTS.—

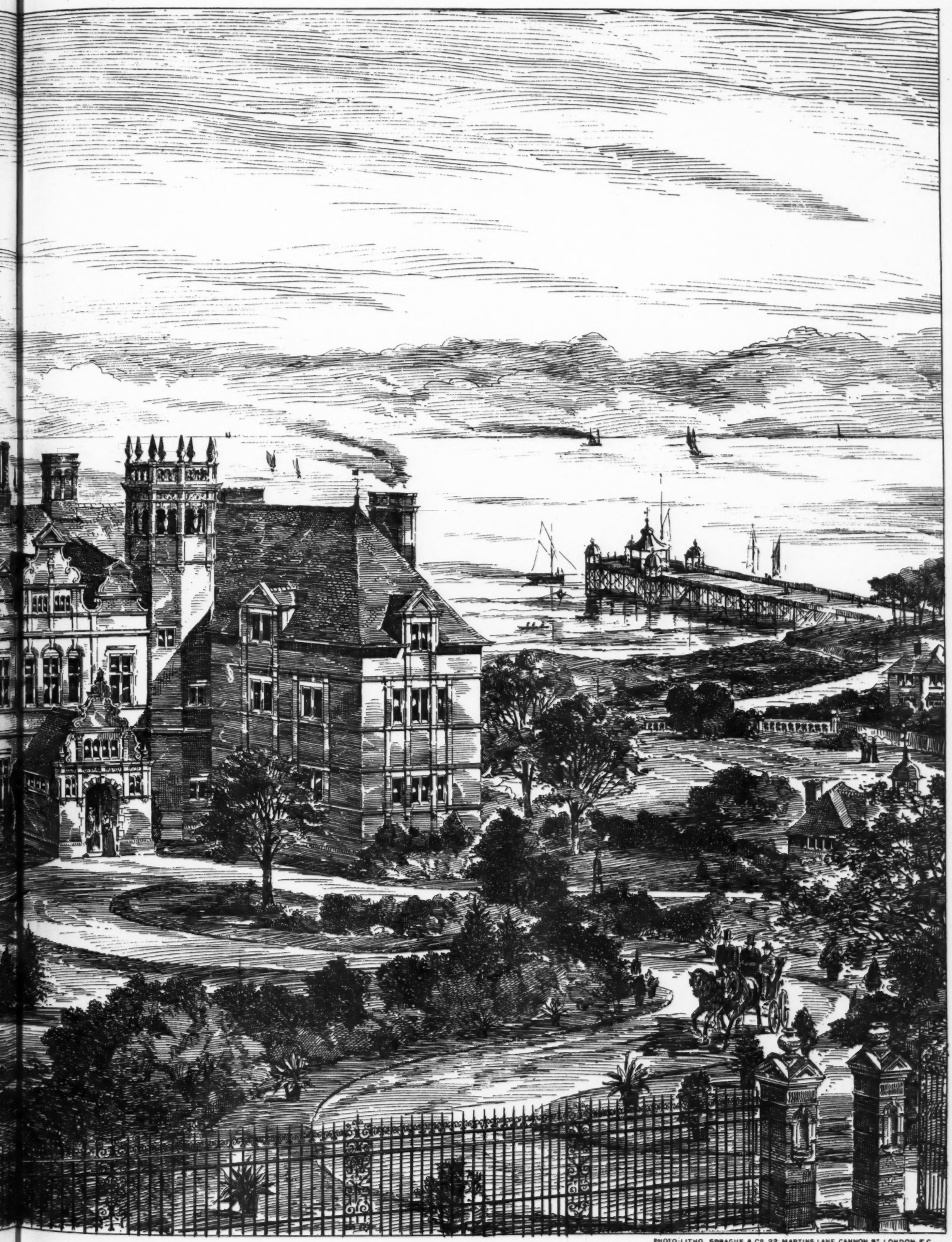


PHOTO-LITHO SPRAGUE & Co 22, MARTINS LANE, CANNON ST, LONDON, E.C.

A. ANTS.—Mr. W. C. Evans, F.R.I.B.A., Architect.